HEPATITIS

Hepatitis is a serious VIRAL infection of the liver that makes a person yellow or "jaundiced".

One of the ways that it is transmitted is through contact with the blood of an infected person.

People can have the virus in their blood and not be sick or know about it. If this person has an injection, the needle and syringe become contaminated with this persons blood that carries the hepatitis virus. If the needle or syringe is used again on another person, this second person may get hepatitis virus into their blood also and become infected.

If you prick yourself with a used needle by mistake, you can become infected with hepatitis also.

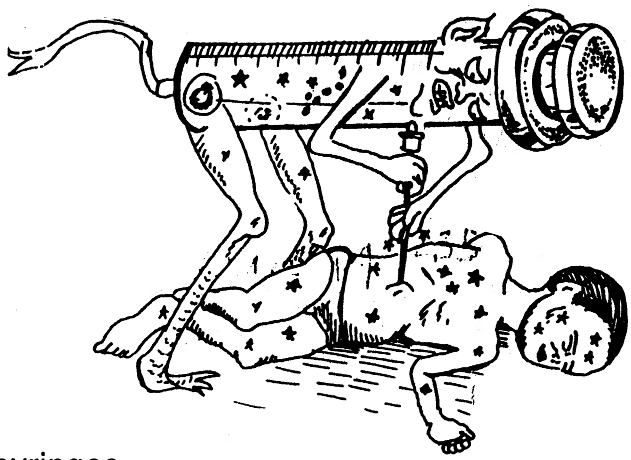


Fig. 15-2. Dirty syringes may cause hepatitis
Source: Primary Child Care

A.I.D.S. (Acquired Immuno-Deficiency Syndrome)g

AIDS is a deadly viral infection that destroys the body's immune system.

One of the ways that it is transmitted is through contact with the blood of an infected person, just like hepatitis.

People can have the AIDS virus in their blood and know about it years before they become sick and die from it. If this person has an injection, the needle and syringe become contaminated with this persons blood that carries the AIDS virus. If the needle or syringe is used again on another person, this second person may get AIDS virus into their blood also and become infected.

If you prick yourself with a used needle by mistake, you could become infected with AIDS also.

USING UNSTERILE SYRINGES AND NEEDLES READS HEPATITIS AND AIDS AND CAN CAUSE ABSCESSES

HANDLE NEEDLES CAREFULLY TO AVOID PRICKING YOURSELF

15.3. DISPOSAL OF NEEDLES AND SYRINGES

It is extremely important to not allow one single syringe or needle to be left behind after an EPI session. **PEOPLE WILL FIND THEM AND TRY TO USE THEM AGAIN,** thus exposing themselves to abscesses, hepatitis, and AIDS.

AFTER EACH SESSION COUNT THE NUMBER OF INJECTIONS GIVEN AND THE NUMBER OF USED SYRINGES AND NEEDLES YOU HAVE USED. THEY SHOULD BE THE SAME NUMBER. IF THEY ARE NOT THE SAME FIND THE MISSING SYRINGES AND NEEDLES.

How to burn your used syringes and needles:

* Find an enclosed area that is INACCESSIBLE to people.
* Dig a pit at least 5 feet deep.
* Build a small (1 foot) wall around it to keep people from falling inside.
* Throw all your needles and syringes into the hole **DAILY.**
* Pour in a small amount of kerosene or gasoline.
* Ignite and burn **THOROUGHLY.**
* Wait until everything is completely burned, then cover with dirt.

15.4. REASONS FOR USING STERILIZATION SYSTEM OF NEEDLES AND SYRINGES

The World Health Organization is now recommending using reusable needles and syringes that are sterilized daily because of all the problems with disposable equipment. Pakistan is soon to convert to this system as well.

Problems with disposable equipment

* Disposable equipment costs 3 times more than reusable.

* Disposable equipment must be shipped in large amounts. Often supplies run short. As a result programmes are either stopped or worse, needles and syringes are used over and over again without proper sterilization.

* Disposable equipment is not properly disposed of and USED again risking the spread of AIDS, hepatitis, and skin infections (abcesses).

15.5. METHODS OF STERILIZATION

CHEMICALS - Chemicals are not very effective as they DO NOT KILL TETANUS SPORES.

BOILING - Boiling kills most of the microbes, but it does not guarantee that all of them, such as tetanus spores, are killed. During boiling the temperature is +100 C. You can heat instruments for 20 minutes in steam from boiling water, or for at least 20 minutes directly in boiling water.

STEAM STERILIZERS - Stream sterilization kills all microbes and guarantees that the instruments are completely sterile. During steam sterilization the temperature is between +121 C and +132 C. It is the best method of sterilization.

FOR THESE REASONS THE AFGHAN REFUGEE/EPI PROGRAMME IS NOW CONVERTING TO STEAM STERILIZED REUSABLE SYRINGES AND NEEDLES.

15.6. STEAM STERILIZER EQUIPMENT

Equipment supplied with sterilizers:

TYPE	SYRINGES	No	NEEDLES	No.
For mixing:	5 cc	8	long 18 gauge	12
Intradermal	BCG	20	10 mm/26 gauge	48
Intramuscular Intradermal	DPT/TT Measles	70	30 mm/22 gauge	144

PART	FUNCTION	No.
Sharpening stone	To sharpen needles	2
Forceps	Maintain sterile technique	2
Timer	Time sterilization cooking	1
Soap boxes	Handwashing	2
Scrub brushes	Handwashing	2
Thermos jar	Spirits/cotton	1
Thermos jar	To keep forceps sterile during session	1
Wire	To clear needle obstruction	1
Metal files	To open ampules	12

PARTS OF STERILIZER

A steam sterilizer consists of 4 parts;

- the sterilizer base;
- the sterilizer cover, which fits securely onto the base;
- the rack, to hold syringes and needles;
- the rack cover

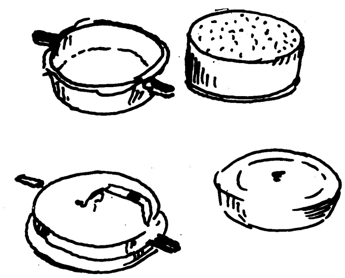


Fig. 15-3. The four parts of a steam sterilizer
Source: WHO

* Canvas bag- to carry the sterilizer to EPI session site.
* Plastic bowl- for soaking used syringes and needles.

15.7. HANDLING THE NEEDLE AND SYRINGE

HAND CONTAMINATION

Unclean hands are a major source for contaminating your equipment.

To handle your sterile equipment from the sterilizer, you must have **CLEAN HANDS.**

BEFORE TOUCHING ANY STERILE PARTS FROM YOUR STEAM STERILIZER YOU MUST SCRUB ALL THE MICROBES OFF YOUR HANDS AND ARMS.

HANDWASHING

* Roll up your sleeves.

* Wash your hands and arms vigorously with **SOAP** and water.

* Follow this by scrubbing your hands and arms for 3 minutes with soap and water using the provided brush.

* Air dry. **DO NOT DRY YOUR HANDS ON A DIRTY TOWEL.**

* Explain the importance of handwashing with hSOAPg to any observers at the EPI session while you are doing this.

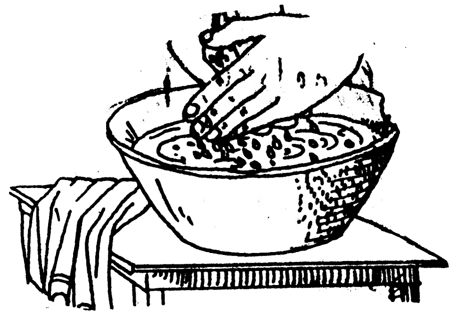


Fig. 15-4. Wash your hands
Source: WHO

PARTS OF SYRINGE AND NEEDLE

It is important to keep all the parts that come into contact with the person being vaccinated completely **STERILE.**

To give an injection, you have to hold the syringe with your hands. The parts that you touch become contaminated. You must learn to hold syringes so that there is no possibility of injecting microbes.

TOUCH ONLY "SAFE" PARTS OF THE SYRINGE

When you hold a sterile syringe in your hand, touch ONLY;

-the outside of the barrel
-the top of the plunger

Be careful NEVER to touch:

-the shaft or bevel of the needle
-the adaptor of the syringe
-the shaft or seal of the plunger

These are the parts from which microbes could be injected into a person.

If you accidentally touch these parts you must discard the syringe and/or needle and take a new sterile syringe and/or needle.

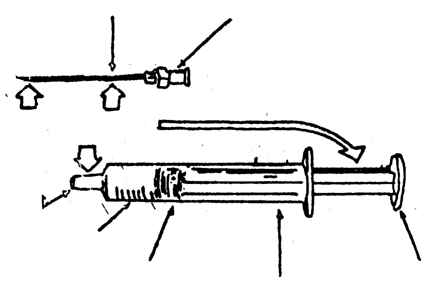


Fig. 15-5. The parts of a syringe and needle that you must not touch.
Source: WHO

KEEP INSTRUMENTS IN A STERILE COVERED CONTAINER

Keep them in the steam sterilizer with the lid on top

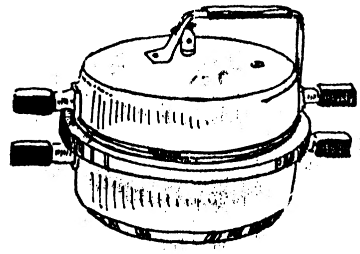


Fig. 15-6 The Steam sterilizer Must be kept closed
Source: WHO

USE STERILE FORCEPS TO TAKE STERILE INSTRUMENTS OUT OF THE CONTAINER.

DO NOT take instruments out of the container with your hands. IF you put your hand into the container, you contaminate all the instruments.

Sterilize a forceps with the syringes; and then keep the forceps in the sterilizer or in a container of spirits.

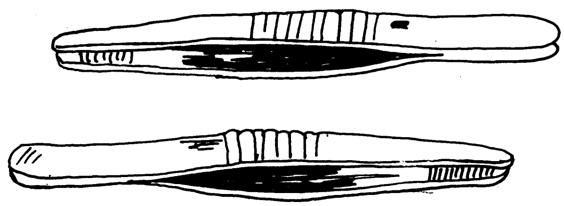


Fig. 15-7. Forceps
Source: WHO

DO NOT put a sterile syringe on the table - the syringe will be contaminated.

15.8. HOW A STEAM STERILIZER WORKS

The instruments are sterilized in steam from the water - not in the water itself.

The steam reaches a temperature of between + 121 C and + 132 C, which is much hotter than boiling water.

All bacteria and viruses are killed if they are heated to this temperature for **20 MINUTES** - including tetanus spares, AIDS and hepatitis virus.

So steam sterilization can guarantee complete sterility.

15.9. HOW TO LOAD A STEAM STERILIZER

Arranging the syringes and needles in the rack

* Put the barrels of the syringes in the largest holes in the rack.
* Put the plungers in the medium sized holes.

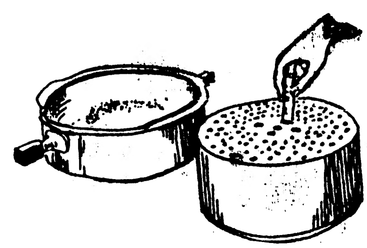


Fig. 15-8. Put the barrel of a syringe into one of the larger holes of the rack. Source:WHO

* Put the needles with the point downwards in the smallest holes
* Be careful not to jab the tips of the needles against the rack as you put them in - it will make them blunt.

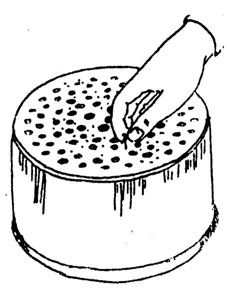


Fig.15-9. Putting a needle into one of the smallest holes of the rack Source:WHO

Put BCG needles near BCG syringes; put intramuscular needles near the 1 ml syringes, and put mixing needles near the 5 ml syringes. This arrangement makes it easier to unload them.

* You can see the differences:

NEEDLES

mixing	adaptor top flat
BCG	adaptor top flat
DPT/TT/Measles	adaptor top ridged

SYRINGES

mixing	yellow large plunger/large barrel
BCG	blue plunger/ridged barrel top
DPT/TT/Measles	yellow small plunger/flat barrel top

Putting water into the sterilizer base

There is a mark on the inside of the sterilizer base, to show where the top of the water should reach.

* Put water in until it reaches this mark.

You can see that with the steam sterilizer, the water does not cover the instruments. They will be sterilized in steam from the water - not in the water itself.

NEVER HEAT THE STERILIZER WITHOUT WATER AS IT WILL MELT YOUR SYRINGES VERY QUICKLY

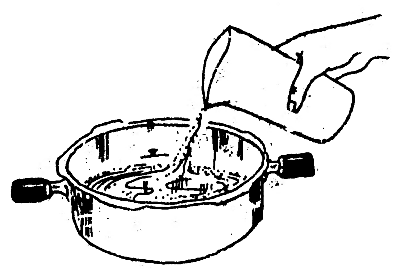


Fig. 15-10. Putting water into the sterilizer base, up to the mark
Source:WHO

Putting the parts of the steam sterilizer together

1. Put the loaded rack in the sterilizer base

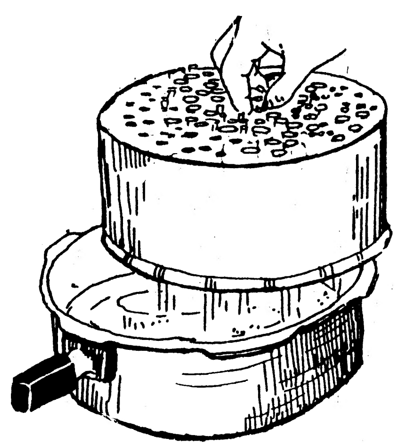


Fig. 15-11. Putting the loaded rack into the sterilizer
Source:WHO

2. Put the rack cover on the rack

Squeeze the clip in the handle of the cover, so that it fits into the central hole in the rack.

NOTE: With the double rack sterilizer, put a cover on each of the racks. Place the racks on top of each other in the sterilizer base.

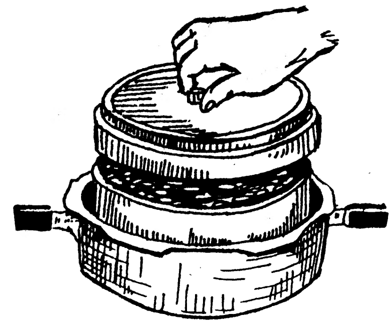


Fig. 15-12. Putting the cover on the rack
Source:WHO

3. Put the forceps on each rack cover.

* Look at the sterilizer cover - check that the rubber seal is in good condition.

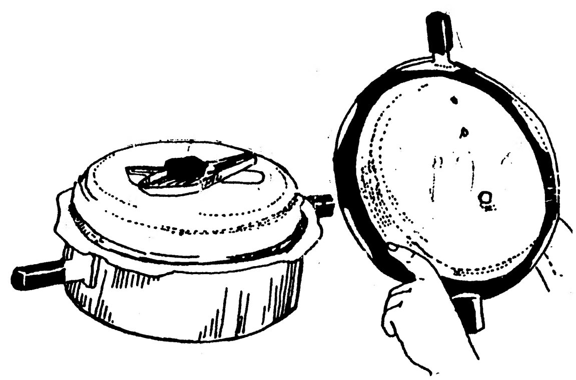


Fig. 15-13. Checking the rubber seal
Source:WHO

4. Put the sterilizer cover onto the sterilizer base.

First, put the cover so that the handles are as shown in Picture: There should be a mark V to line up with the handle on the base.

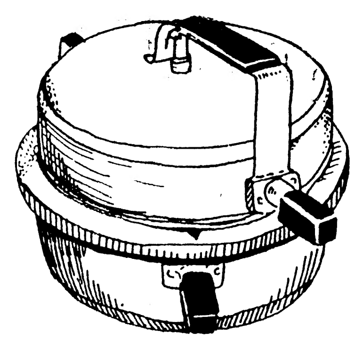


Fig. 15-14. Put the sterilizer cover in this position first
Source:WHO

Next, press down on the handles of the cover, and turn the sterilizer cover clockwise until it will not turn any more.

Now the handles of the cover and of the base should be together.

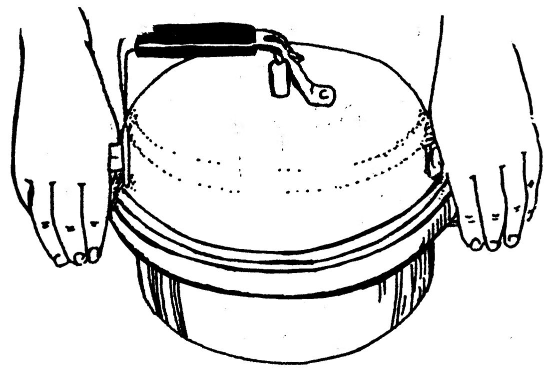


Fig. 15-15. Turning the sterilizer cover so that the handles of the base and the cover are together.
Source:WHO

The two valves of the steam sterilizer

There are two valves in the sterilizer cover.

The safety valve is a small black circle of rubber with a metal pin in the middle. This valve blows open if the sterilizer boils dry.

* Check that the metal pin in the safety valve is down.

The pressure valve is a lever which controls the steam in the sterilizer. It is in the center of the cover.

* Before you start sterilizing, CLOSE the pressure valve. Push the lever DOWN into the position shown in Fig. 15-15.

When the small lever is UP, the valve is OPEN. When the small lever is DOWN, the valve is CLOSED

15.10 STERILIZING WITH THE STEAM STERILIZER

Heating the sterilizer

STEP 1 Put the stove on a firm surface, more than 40 cm above the floor.

STEP 2 Put the sterilizer on the stove. Make sure that the valve is down (closed).

STEP 3 Light the burner, and turn it on full. After a few minutes, steam comes out strongly from the pressure valve.

2. HEALTH EDUCATION

Health education is the responsibility of EVERY medical staff member. It is a VIOLATION OF HUMAN RIGHTS not to explain what you are doing to a patient and why you are doing it.

INFORMATION NECESSARY TO BE COMMUNICATED TO FAMILIES

* Vaccines protect from six diseases.
* What the 6 diseases are.
* When the vaccines should be given
* How many doses are needed/necessity of 3 doses
* Side effects of vaccines
* Safety in pregnancy and in mild illness
* When and where to get vaccines
* Importance of the EPI card

THE EPI PRIME MESSAGES TO BE COMMUNICATED

* A child who is not vaccinated is more likely to become sick, disabled, and die.

* Childhood vaccination protects against six dangerous diseases: polio, measles, whopping cough, diphtheria, TB, and tetanus.

* All vaccination must be started as soon after birth and should be completed in the first year of the child's life.

* Every woman should be fully vaccinated against tetanus to protect both herself and her babies from tetanus.

* It is safe to vaccinate newborn babies, sick children, and pregnant women.

* Vaccination cards are important. They must be kept safely by the family. They should be brought with the woman and child on every visit to the clinic and health worker.

* Infants must complete the full course of vaccination, otherwise the vaccine will not work.

* After vaccination the child may develop a fever or rash or a small sore. These are not dangerous problems and parents should not worry about them.

HOW TO COMMUNICATE HEALTH EDUCATION

* Be polite and respectful
* If the person does not understand, use a translator
* Speak slowly and clearly
* Point to pictures or objects to demonstrate your points

STEP 4 Set the timer for 5 minutes.

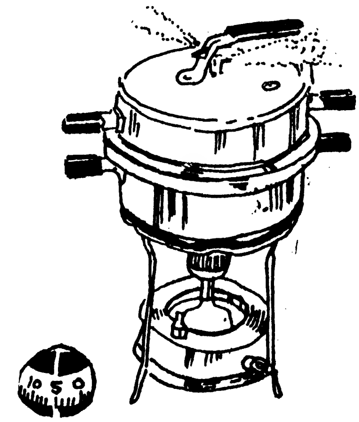


Fig. 15-16. Steam coming out from pressure valve; Timer set for five minutes.
Source:WHO

STEP 5 When the timer bell rings, turn the burner down so that steam coming out less strongly, but it is important that you can still hear steam coming out of the valve.

STEP 6 Reset the timer for another 15 minutes. Make sure that you can hear steam coming out of the pressure valve all the time.

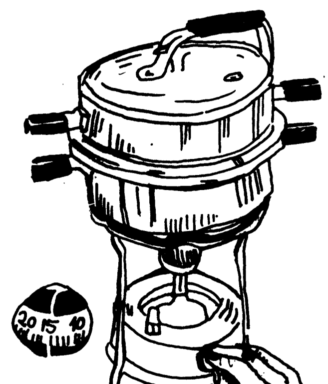


Fig. 15-17. Turning down the burner; timer reset for 15 minutes.
Source:WHO

NOTE: Up to 2,500 meters (8,300 feet) operate as shown in this instruction booklet. For operation between 2,500 meters and 7,000 meters (23,000 feet) reset the timer for 30 minutes, not 15 minutes, to achieve sterilization.

When the timer bell sounds after 15 minutes:

STEP 7 Turn off the heat

STEP 8 OPEN the pressure valve (lift the lever UP). This reduces the pressure. A lot of steam escapes, and it is very hot.

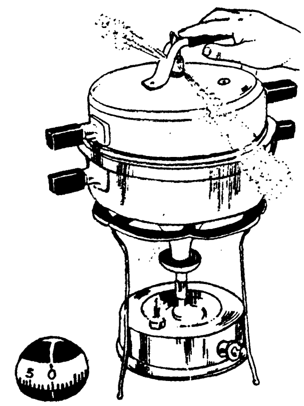


Fig. 15-18. Lifting the lever of the pressure valve to reduce pressure
Source:WHO

Opening the steam sterilizer

* Keep the sterilizer closed until mothers and children have arrived, and you are ready to start immunizing.

* When you are ready, turn the sterilizer cover anti-clockwise until it will not turn any more. Then lift the cover off, and put it **upside down** on the table. Put the rack cover inside the lid and forceps in thermos with spirits.

15.11 USING THE INSTRUMENTS FROM THE STEAM STERILIZER

* Squeeze the bottom of the catch in the middle of the rack cover; remove the rack cover carefully; and put it inside the top of the sterilizer.

* Take the sterile forceps from the thermos with spirits.

* Tap off the excess spirits to keep them from running down into the syringes and killing the vaccines.

* Pick up the plunger of the syringe that you need. Fit the plunger into the barrel in the rack.

* Now pick up the whole syringe, and fit the adaptor into the correct size needle.

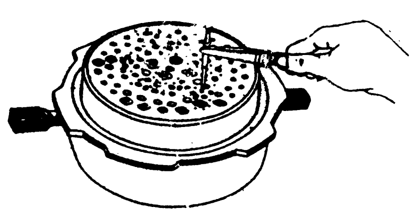


Fig. 15-19. Putting the adaptor of the syringe into the right needle
Source:WHO

* With your forceps carefully lock the needle onto the syringe.

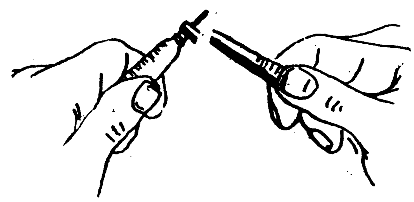


Fig. 15-20. Using sterile forceps to put needle onto the syringe
Source:WHO

* Immediately return the forceps to the thermos with spirits.

* Put lid back on the needle and syringe rack to **KEEP DUST AND DIRT OFF YOUR STERILE EQUIPMENT.**

* Immediately use your syringe and needle.

* Irrigate the needle and syringe 3 times, separate the parts and put them in the plastic bowl with **PLAIN** water.

* Drawing water through the needle helps to prevent the needle from becoming blocked.

* BCG needles may be blocked by vaccine. Subcutaneous and intramuscular needles may be blocked by blood or serum.

15.12 CLEANING AND CHECKING THE NEEDLES AND SYRINGES

* You must clean instruments before you can sterilize them.

* Small amounts of blood, serum, and vaccine can stick to them, especially inside needles, and in the corners of syringes.

* Boiling and steam do not remove blood and serum.

* Blood and serum will cover microbes and protect them from the heat.

* If you do not clean your instruments thoroughly, boiling and steam may not kill all the microbes on them.

* Irrigate and soak your needles and syringes in water immediately after using them.

* It is much easier to remove any vaccine, serum, or blood at this time, before it sticks hard.

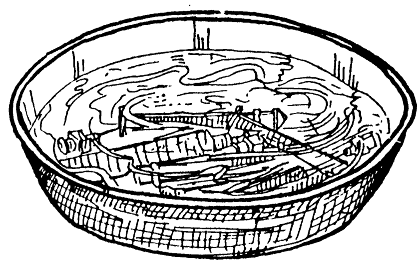


Fig 15-21.Used syringes and needles soaking in a container of cold water. Source:WHO

Soaking instruments immediately after you use them

* Keep a separate container for used instruments.

* Put some clean cold water into it.

* Then separate the needle, barrel, and plunger, and put them all into the container of cold water to soak.

In BHU: How to clean a syringe

* Draw clean water in and out of the syringe several times, (without the needle).

* Take the plunger out of the barrel and clean each part carefully. Rinse the barrel through with water, and wipe the plunger with a cloth. Make sure that no visible traces of blood, serum, or vaccine remain in the barrel when you have finished.

Check that the seal (rubber ring) is sealing properly e.g the tightness of the syringe.

Check that the hub fits onto the tip of the syringe.

Check that the marking on the syringes and needles are closely readable.

After cleaning and checking the syringes, load the sterilizer ready for sterilization.

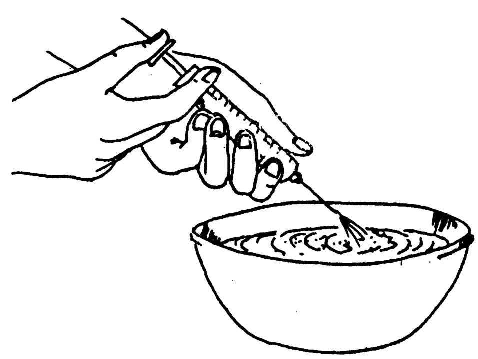


Fig. 15-22. Washing the syringe in water
Source:WHO

In BHU: How to clean a needle

* Take a clean 5 ml syringe, fill it with clean water, and wash through the needle several times, (as if you were injecting). If the water does not go through the needle, it means that the needle is already blocked. Throw the needle away.

* Put some cotton wool on the end of a match stick, and wipe the inside of the needle adaptor.

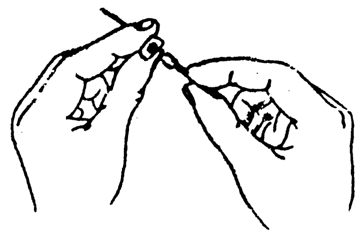


Fig. 15-23. Wiping a needle adaptor with cotton wool.
Source:WHO

* Feel the point for BLUNTNESS on your finger nail.

* Test the point for BARBS.
Draw the needle along some cotton wool.
If the needle is barbed, you will feel it catch in the cotton wool.

* If the needle is blunt or barbed, sharpen or throw it away. Injecting with a blunt or barbed needle is painful, and it can damage the tissues and promote infection. You cannot give an intradermal injection correctly (for BCG) using a blunt or barbed needle. The needle goes too deeply into the skin.

TO NO GIVE INJECTIONS WITH A BLUNT OR BARBED NEEDLE

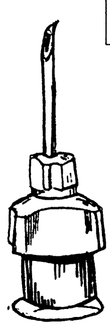


Fig. 15-24 Barbed needle.
Source:WHO



Fig. 15-25 Testing for a barb
Source:WHO

How to sharpen a barbed needle

You need a needle sharpening stone.

* Hold the bevel of the needle flat on the needle sharpening stone. When the bevel is flat on the stone, the needle is sloping (or leaning).

* Push the needle backwards and forwards. Keep the needle with the same slope all the time that you move it on the stone.

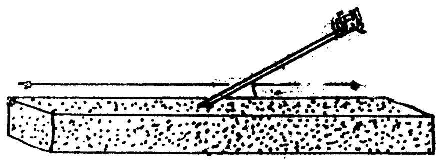


Fig. 15-26.How to sharpen a needle on a needle sharpening stone
Source:WHO

The slope of the needle

* The slope of the needle decides the length of the bevel.

* Choose a slope that keeps the bevel the same as when the needle was new.

* Fig. 15-27 shows someone sharpening a needle with a slope that is too STEEP. The bevel will be too SHORT, and it will be difficult to push the needle through the skin.

* Fig. 15-27 also shows that the person is changing the slope of the needle, up and down, as he moves the needle on the stone. Changing the slope will make the end of the needle ROUND. The needle will not be sharp enough.

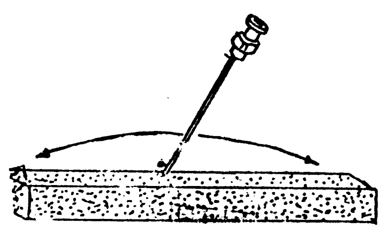


Fig. 15-27. How NOT to sharpen a needle on a needle sharpening stone
Source:WHO

Making "facets"

* After you have sharpened the front of the bevel, you need to make small facets on the back of the bevel.

* Turn the needle over.

* Push the back of the tip of the bevel gently along the stone, as in Picture .

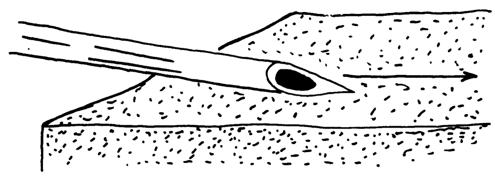


Fig 15.28 Pushing the needle on the needle sharpening stone to make facets
Source:WHO

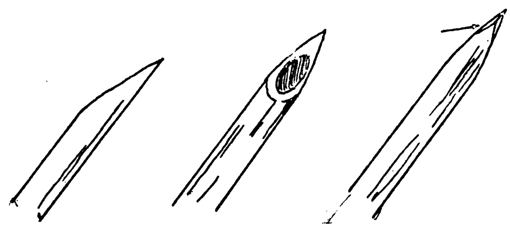


Fig. 15-29. A well sharpened needle
Source:WHO

After cleaning and checking the equipment

* Pour out the remaining water from the sterilizer.
* Load your sterilizer.
* Clean and dry the sterilizer.

15.13 WHEN TO DO STERILIZATION

This depends on your programme and your situation.
Clean and sterilize:

* **BEFORE** you go to the immunization session.

* **AFTER** you come back from the immunization session.

REMEMBER THAT THE INSTRUMENTS MUST BE STERILIZED FOR 20 MINUTES AND THEY MUST BE ALLOWED TO COOL BEFORE YOU USE THEM.

Place and time of sterilization	Advantages	Disadvantages
CENTER BEFORE SESSION	You are not so tired	Instruments more difficult to clean if dirty overnight.
	You can prepare other things while the instruments boil	Takes too long to clean and sterilize now
	You can go home earlier at night	You reach the site later
	You can do it while you wait for the vehicle	Mothers do not want to wait
AT BHU CENTER AFTER SESSION	Instruments easier to clean now	You go home later
	You do not keep anyone waiting	Health workers may not do the job so well at this time.
	Instruments ready so you can start earlier tomorrow	
	You can come back to to the health center earlier after the session	

15.14 PROBLEMS WITH STERILIZER AND SOLUTIONS

If you think that the sterilizer is not working properly:

* Turn off the heat
* Open the pressure valve (lift it UP)
* Wait for the sterilizer to cool.

> IF YOU USE TOO LITTLE WATER; OR IF YOU HEAT THE STERILIZER FOR TOO LONG WATER MAY ALL BOIL AWAY. THE STERILIZER WILL OVERHEAT, AND THE SYRINGES MELT.

1. The steam comes out from underneath the lid.

* Turn off the burner and lift the steam valve to reduce the pressure.

* Wait a few minutes for the sterilizer to cool.

* Turn the sterilizer lid anti-clockwise until it will not turn any more. Take off the lid.

* Correct the position of the seal.

* Wipe the rubber seal on TOP and UNDERNEATH.

* Fill water up to the mark on the inside of the sterilizer wall.

* Put the lid back and start the sterilization again.

2. If the steam STILL comes out from underneath the lid.

* Repeat the same process as above and fit a NEW rubber seal, ensuring that you fit only a genuine Prestige gasket into your Prestige sterilizer - this sterilizer will not work with other manufacturer's gasket seals.

3. If steam leaks from the safety valve, located on the top of the lid:

* Turn off the burner, release the steam pressure and remove the lid.

* Check that the metal pin is properly seated inside the rubber plug and that the plug is the right way up. The top is marked "TOP".

* If the pin is standing up above the rubber plug, push the pin down with one hand while supporting the inside of the plug with the other hand.

* If the pin is correctly positioned, and steam still leaks from the safety valve, renew the whole safety valve.

4. If the pin on the safety valve pops up during sterilization and releases steam:

* Turn off the heat and open the sterilizer.

* Ask a technician to check the steam valve in the center of the lid and to replace the safely valve.

NEVER TRY TO OPEN THE STERILIZER LID BY FORCE WITHOUT FIRST RELEASING THE STEAM VALVE.

5. Please ensure water level and timing are correct, otherwise all the water can be boiled away which will cause overheating and the syringes will melt.

6. Should steam be observed escaping from between the sterilizer lid and the point at which the pressure valve makes contact with the lid, ask a technician to lighten the locking nut of the pressure valve under the lid or to replace the pressure valve until completely.

   NOTE: The sterilizer will overheat after about 35 minutes of high heat.

* Use simple words...NOT MEDICAL TERMS
* Ask the person if they have any questions
* Ask them to repeat the information to be sure they understand

(See UNCHR/CCAR Health Education Guidelines)

REMEMBER THAT PEOPLE WHO DO NOT READ ARE NOT STUPID. THEY MAY BE JUST AS INTELLIGENT AS YOURSELF. THEY HAVE NOT HAD THE OPPORTUNITY TO BE EDUCATED. THEY HAVE A GOOD CAPACITY TO LEARN.

WHEN TO GIVE HEALTH EDUCATION

1. While you give vaccines
2. In the BHU, Antenatal and child clinics

GUIDELINES FOR GIVING EPI INFORMATION TO GROUP MEETINGS

The following is a brief summary of the information that may be presented.

* GOAL OF EPI PROGRAM
  - to vaccinate all newborns
  - to vaccinate all women 15-45 years
  - before people return to Afghanistan
  - EPI like a jihad against diseases

* HOW VACCINES WORK
  - Teach the body to fight against the 6 diseases
  - Work like a tawiz

* EPI DISEASES KILLS/DISABLES 3.5 MILLION CHILDREN A YEAR

Measles
- Fever, rash, red-eyes, pneumonia, diarrhoea
- Biggest killer...2 million/year in world
- Spreads like fire in a RV in un-immunized
- Without immunization every child will get sick
- Only one shot needed at 9 months

[SHOW PICTURE OF MEASLES]

Tetanus:
- Rigid body, difficult breathing of newborn
- Kills 800,000 newborns/year
- Half of death in newborn from tetanus
- Vaccinate all women 15-45..ESPECIALLY PREGNANT WOMEN to prevent this disease:
  - boil knife 30 minutes before cutting the cord
  - keep cord clean

16. SURVEILLANCE

16.1. POLIO CASE DEFINITION

Surveillance is the collection of data about cases of the target diseases.

16.2. THE USE OF SURVEILLANCE

Surveillance provides information about the diseases so that action can be taken and the number of cases of diseases reduced. Surveillance data is used to:

* evaluate the impact of the immunization services on the number of cases of illness and death.

* identify population groups within the community with a high risk of illness and death so that immunization services can be used to prevent them from getting the disease.

* observe the disease trends, that is whether the amount of disease is reducing or increasing with time.

* identify and control outbreaks of disease.

16.3. THE DIFFERENT METHODS OF SURVEILLANCE

ROUTINE REPORTING SYSTEM

The BHU health staff collect information on the target diseases and report on the number of cases monthly. For this information to be useful, as many cases as possible of the diseases actually occurring in the refugee village should be reported. All health staff, for example CHWs, FHWs, vaccinators, sanitarians and other outreach staff, if they see a case of measles or other target disease in the community should ensure that the patient is seen in the BHU or visited by the medical officer.

The medical officer should personally examine all cases of the target diseases and confirm whether the patient has the disease. The details of the patient should be entered in the Individual Case Form Register kept by the medical officer in the BHU. The surveillance report form should be completed monthly and submitted to the FSMO.

E.P.I. SURVEILLANCE REPORT
AFGHAN REFUGEES N.W.F.P.
TALLY SHEET

BHU/SHU____________________ MONTH______________

DISTRICT/FSMO______________ YEAR________________

Diseases	Immunized	Unimmunized	Unknown	Total
Measles				
Pertussis				
Diphtheria				
Neonatal Tetanus				
Other Tetanus				
Poliomyelitis				
Tuberculosis				

Each tally mark ("1") represents one case of disease.

* Immunized: Please write name and address of Immunized Cases.

Fig 16.1 EPI Surveillance Report Form

Case investigation

Case investigation refers to the detailed investigation of patients to determine why the case of disease has occurred. It is most commonly performed for neonatal tetanus cases or polio cases. From 1991 all cases of the six EPI diseases will have to be investigated and a case investigation form completed (see section 16.1, pp. 121)

Outbreak investigation

Outbreak investigations are studies conducted to control epidemics of vaccine preventable diseases. The outbreak investigation should determine who is getting the disease, when and where it is occuring, where it came from and who among the cases were vaccinated.

The information collected is analysed and used to:

- indicate the most appropriate control measures
- indicate where and to whom to apply these measures
- determine why the outbreak occurred
- prevent similar outbreaks.

16.4 CASE DEFINITIONS

To conduct surveillance health staff need to be able to recognise the disease. A standard case definition is essential so that everyone is reporting the same and that results can be compared from district to district and from one year to another.

POLIO CASE DEFINITION

Any patient with acute flaccid paralysis for which no other cause can be found.

MEASLES CASE DEFINITION

- Fever greater than 38 C
- Generalized rash lasting 3 days or longer
- Plus at least one of the following:
  cough, coryza or conjunctivities.

PERTUSSIS CASE DEFINITION

- Cough lasting more than 2 weeks
- Plus at least 2 of the following:
  - breath intake and whoop
  - paroxysms of cough
  - vomiting after coughing.

NEONATAL TETANUS

-Infant normal at birth
- Begins breastfeeding normally
- Stops taking breast milk after 2nd or 3rd day
- Spasms and risus sardonicus (a grinning expressing produced by spasms of the facial muscles)
- Dies within first month of life.

ADULT TETANUS

- Severe muscular spasms and risus sardonicus.

DIPHTHERIA

- Severe throat infection with grey-coloured membranes in a sick child.

TUBERCULOSIS

- Adult pulmonary TB; sputum positive for Acid Fast Bacilli (AFB).

Symptoms of TB in children:

- losing weight or failing to gain weight
- cough or wheezing for more than one month
- mild unexplained fever.

To confirm the diagnosis, sputum should be examined.

16.5 COMPILATION OF DATA

The individual case form register will contain all the details of the patients confirmed to have the vaccine preventible diseases. This information can be analysed to give much more information about the disease in the community.

THE DISEASE MAP

The location of the houses of the cases of the target diseases or just

the measles and polio cases can be marked on a map. In this way the distribution of the cases can be easily seen and whether there are any clusters of the diseases in certain area.

THE DISEASE GRAPH

The disease graph records the number of cases over a period of time, usually one year and makes the analysis of the information much easier. It is easy to see whether the number of cases is increasing or decreasing.

The medical officer is responsible for making sure that the surveillance information collected at the BHU is reliable, accurate, complete and submitted regularly. He is also responsible for the analysis of the information.

- information will be collected and sent if appropriate.
- laboratory specimens will be collected and sent if appropriate.
- the case will be followed up by the BHU staff.
- If indicated the case will be referred for rehabilitation.

16.7 ANALYSIS OF DATA

Data obtained from the reporting system should be analyzed at every level of the health system, that is at BHU level, district level, provincial level and at Islamabad. However, analysis at the BHU level is most important since this is where once problems are identified, action can be taken quickly to solve them.

In analysing the data, use is made of the monthly surveillance report form, the disease graph and map, and any special case investigation forms.

The following information can be obtained:

- disease trends
- age distribution of cases
- immunization status of cases.

DISEASE TRENDS

Disease trends refers to an increase or decrease in the number of cases of disease over time. An increase can indicate that there is a problem with the vaccination programme. There are 4 major factors which influence the number of reported cases of a disease.

* the completeness of reporting
* the immunization coverage
* the seasonal variation, some diseases are more likely to occur at certain times of the year than other times.
* the epidemic pattern, some diseases such as measles and pertussis occur in epidemics every 2 or more years.

IF THE DISEASE TREND INCREASES THE M.O. SHOULD:

1. Check surveillance reports for counting errors.

2. Check to see if the increase can be explained by any new situation, for example the arrival of a number of new refugees.

3. Check for changes in staff or procedures which may cause a change in completeness of reporting or a change in definition used for diagnosis.

4. Compare the vaccination coverage level with past levels.

5. Determine the immunization status and ages of confirmed cases.

6. Calculate what percentage of all cases were immunized child ren. Use the following formula:

$$\frac{\text{Number of Cases who were immunized}}{\text{All cases (both immunized and not immunized).}} \times 100 = \text{Percentage of all cases in immunized children.}$$

7. If more than 10% of cases were immunized children, check the immunization programme for any other problems that might cause an increase in the number of cases.

   This includes whether:

   - health workers are following the vaccination schedule correctly.
   - immunization reports are accurate and correctly report the number of vaccinations given.
   - health workers are reconstituting the vaccine correctly and vaccinating in a correct manner.
   - the cold chain has broken down either now or sometime in the past.

IF THE DISEASE TREND DECREASES THE M.O. SHOULD:

1. Check the surveillance reports for counting errors.

2. Check to see if the decrease can be explained by any new situation, for example refugees repatriating to Afghanistan.

3. Check to changes in staff or procedures.

4. Compare immunization coverage levels to past levels. If the coverage increases then you can expect to see a decrease in the number of cases.

5. Review records, including the monthly report form and the BHU registers and look for additional unrecorded or misdiagnosed cases.

If the disease trend can not be explained by any of these causes then the vaccination programme is working and having an impact.

17. SUPERVISION

17.1. PRINCIPLES OF SUPERVISION

Good supervision is the most important factor in maintaining a good EPI program. Supervision should include:

* Motivation and encouragement of staff
* Monitoring the quality and quantity of work
* Providing feedback to staff on their work
* Receiving feedback from staff regarding field problems
* Providing training

17.2. SUPERVISORY VISITS

Supervisory visits must be scheduled in advance on a regular basis, although announcement of such is up to the supervisor. Pre-scheduled visits allow the supervisees to prepare questions for their supervisors and demonstrate their best performances. Surprise visits allow the supervisor to observe normal functions as they exist.

SUPERVISORY VISITS SHOULD NOT BE VIEWED FOR THE PURPOSES OF DISCIPLINE ALONE, BUT AS INSTRUCTIVE AND MOTIVATIONAL

What follows is a suggested supervisory visit frequency schedule:

Medical Officers at BHU Level

Cold Chain: weekly
Sterilization: weekly
Recording: weekly
Supplies: weekly
BHU vaccination: weekly
Mobile teams: monthly

EPI Supervisors at BHU Level

Cold Chain: monthly
Sterilization: monthly
Recording: monthly
Supplies: monthly
BHU vaccination/Mobile teams: monthly

FSMO:

Cold Chain (District level): weekly
Recording (District level): monthly
Supplies (District level): monthly
Surveillance (BHU level): monthly

Cold Chain (BHU): monthly
Sterilization (BHU): monthly
Recording (BHU) monthly
BHU vaccination/mobile teams: monthly

EPI DEPUTY DIRECTOR:

All components/staff yearly

PDH:

During district visits as scheduled by the PDH.

The EPI checklist should be filled out during these visits and instantaneous **FEEDBACK** provided to the supervisee. This should be in the form of **ON THE SPOT TRAINING.**

* If any supervisor is unsure of the proper standards to be observed, please schedule some time with the PDH, EPI Deputy Director, EPI Supervisor, or Provincial Cold Chain Technicians before using the checklist.

The EPI supervisory chain of command is as follows with the note that each staff is ultimately and directly responsible to the PDH himself:

PROJECT DIRECTORATE OF HEALTH (PDH)

EPI DEPUTY DIRECTOR

FSMO

EPI SUPERVISOR   MEDICAL OFFICERS

VACCINATORS   LHVs   DISPENSERS

The appropriate section should be filled out by the supervisor and at the time reviewed with the person or facility being observed. Two copies should be made of the last page summary. One copy should be left with the person at the facility and the other forwarded to the next higher supervisory level. The filled in checklist itself should be retained by the supervisor who has done the review in case any questions arise and for future reference.

17.3. EPI SUPERVISORY CHECKLIST

Locality__________________ Date______________

1. VACCINE STORAGE REFRIGERATOR/FREEZER

		Yes	No
1.1	Is the refrigerator and freezer in working order?		

		Yes	No
1.2	Is there a thermometer in the refrigerator?		
1.3	Is Temperature Monitor Chart maintained?		
1.4	Is the temperature within acceptable range (0-8C)		
1.5	Has DPT or TT vaccine been frozen?		
1.6	Is any of the vaccine in stock expired?		
1.7	Are there frozen ice packs in the refrigerator?		
1.8	Are vaccine in stock properly rotated so the oldest vaccines are used first?		
1.9	Are vaccine stock registers maintained?		
1.10	Are vaccines over or understocked?		
1.11	Is the vaccine wastage an acceptable one?		

2. STORE/SUPPLIES AND EQUIPMENT

2.1 Are the cold boxes in good working order?
2.2 Are the vaccine carriers in good working order?
2.3 Are the cold packs in good working order?
2.4 Are the thermometers in good working order?
2.5 Is the standby generator in working order?
2.6 Are enough syringes in the stock?
2.7 Are enough needles in the stock?
2.8 Are enough immunization cards in the stock?
2.9 Are enough ice packs in the stock?
2.10 Are enough vaccine carriers in the stock?
2.11 Are enough thermometers in the stock?

3. SURVEILLANCE

3.1 Is Medical Officer himself responsible for disease surveillance and data collection?
3.2 Was the last surveillance report submitted on time?
3.3 Are all surveillance reports submitted for last 12 months?
3.4 Are the ages of cases recorded in the BHU records?
3.5 Is the immunization status of EPI target disease cases recorded?
3.6 Are surveillance forms correctly and completely filled out?

4. RECORDS/DISPLAYS

4.1 Is a geographical map of area displayed?
4.2 Is number of immunization graphically displayed?
4.3 Is an up-to-date coverage monitor chart in use and displayed?
4.4 Are immunization posters displayed?
4.5 Is disease incidence graph/charts displayed?
4.6 Is drop out rate displayed?
4.7 Is under 1 Year list easily available?

- birth attendants to wash hands with SOAP
- Women need at least2 vaccinations during pregnancy
- 5 vaccinations for life protection
- 3 vaccinations for children (DPT)

[SHOW PICTURE OF NEONATAL TETANUS]

Pertussis:
- Cough for more than several days, whoops, vomit,
- Kills children particularly under age of 6 months
- Kills 600,000/year-affects millions
- 3 shots needed (DPT)

Diphtheria:
- Sore throat, greyish membrane on the pharynx, neck
- swells, difficult breathing.
- Rare but kills many.
- 3 shots needed (DPT)

[SHOW PICTURE OF DPT DISEASES]

Polio:
- Causes lameness
- Kills 30,000/year
- 3 doses of vaccines needed + 1 at birth

[SHOW POLIO PICTURE]

TB:
- causes chronic cough, weight loss, mild fevers
- affects 10 million/year
- BCG given to child protects from TB
- only 1 shot needed at birth

[SHOW TB PICTURE]

* EPI SCHEDULE

ALL CHILDREN MUST START AT BIRTH AND COMPLETE BY FIRST BIRTHDAY

BCG/Polio O - Birth
DPT/Polio 1 - 1.5 months
DPT/Polio 2 - 2.5 months
DPT/Polio 3 - 3.5 months
Measles - 9 months

[SHOW EPI PICTURE OF SCHEDULE]

ALL PREGNANT WOMEN MUST HAVE TWO VACCINES ONE MONTH APART BEFORE THEY DELIVER TO PROTECT NEWBORNS.

4.8	Is list of the pregnant women easily available?	Yes	No
4.9	Is defaulter list easily available?		

5. STERILIZATION

5.1 Are the sterilizers in good working order?
5.2 Is 5 minutes high and 15 minutes low heat being? practiced in sterilization?
5.3 Is equipment cool before use?
5.4 Is washing hands in practice?
5.5 Are syringes and needles, irrigated and soaked in water after use?
5.6 Are syringes and needles checked for damage?

6. ORGANIZATION

6.1 Is vaccination site clean?
6.2 Is vaccination site shaded?
6.3 Is vaccination site well lighted?
6.4 Is the waiting time too long?
6.5 Is Immunization Session held in an easily reachable location?
6.6 Is the timing of immunization Session convenient for the public?
6.7 Is date of the next visit of team to RV pre-scheduled and announced?
6.8 Is advance notice given for arrival of team in camp each time?

7. IMMUNIZATION PERFORMANCE/TECHNIQUE

7.1 Is one sterile syringe used for each injection?
7.2 Is one sterile needle used for each injection?
7.3 Are used syringes and needles properly disposed of?
7.4 Are vaccines reconstituted correctly?
7.5 Is BCG Scar checked?
7.6 Is dose (amount) administered correctly?
7.7 Is site of immunization correct?
7.8 Is immunization technique correct?
7.9 Is any child denied immunisation because of contra-indication?
7.10 Is sterile technique maintained?
7.11 Does the number of doses of vaccine given correspond with number of disposable syringes used?
7.12 Does the number of doses given corresponds with used discarded vials?
7.13 Is immunization injection site properly cleaned?

8.	RECORDING	Yes	No
8.1	Is age screening done correctly?		
8.2	Is birth date recorded correctly (not age)?		
8.3	Are the dates of immunization recorded in the register correctly?		
8.4	Are children under one marked out in permanent register?		
8.5	Are pregnant women marked out in permanent register?		
8.6	Are records of immunization kept in BHU?		
8.7	Does each child have an individual Immunization Card? (Not family Card).		
8.8	Do the entries of daily register correspond with one of permanent register?		
9.	VACCINE HANDLING (VACCINE CARRIER)		
9.1	Are left over open vials discarded?		
9.2	Are unopened, unused vials stored back in refrigerator?		
9.3	Are open vials properly disposed off?		
9.4	Is temperature in vaccine carrier between 0 to 8 o ?		
9.5	Are DPT/TT Vaccines protected from being frozen?		
9.6	Is BCG protected from light?		
9.7	Is diluent cold?		
9.8	Are vaccines within expiration date?		
9.9	Are the labels on vials protected from water?		
9.10	Are vaccines in use kept on foam in vaccine carriers?		
10.	COMMUNICATION/HEALTH EDUCATION		
10.1	Is the date of next dose communicated?		
10.2	Is the need for 3 dose emphasized?		
10.3	Is the possibility of side effects discussed?		
10.4.	Is staff's attitude friendly?		
10.5	Is group health education carried out during team's visit?		
10.6	Are visual aids used for health education purposes?		
10.7	Is mother asked to keep Immunization Card safely?		
11.	COMMUNITY PARTICIPATION		
11.1	Does the team report to camp administration the results of their performance?		
11.2	Does the team give the names of defaulters to community leaders for follow-ups?		
11.3	Do Community Health Workers participate in reporting of Births and follow up of Immunization defaulters?		

		Yes	No
11.4	Is the list of new borne in this camp known to the team and to Community Health Workers as well?		
11.5	Are local leaders supportive of Immunisation Activities?		
11.6	Are health committee members involved in planning of Immunization Session?		

LEAVE DUPLICATE COPY BEHIND - USE CARBON COPY

COMMENTS AND REMARKS

If any item checked is not satisfactory, elaborate on that and give recommendations for correction. Put your comments item by item under the same numbering in Checklist. Use additional pages if necessary.

17.4. EPI FORUMS AND DISSEMINATION OF INFORMATION

There are a variety of forums in which EPI information can be disseminated and program problems may be solved. They are the following:

CENTRAL LEVEL

1. UNHCR QUARTERLY MEETING- Includes all voluntary agencies and PDH upper level staff (PDH, Deputy Directors, and FSMOs) working in Afghan Refugee health programmes. New policies and plans are presented as well as presentations on specific refugee health problems.

2. EPI MONTHLY COORDINATION MEETING-Includes all major agencies involved with Afghan refugee EPI programmes with UNHCR, UNICEF, AVICENS, and other CAR sector cells who are involved with EPI, such as Social Services and Education.

3. FSMO MONTHLY MEETINGS- All 10 district FSMOs meet monthly with the PDH and Deputy Directors to discuss various health sector plans, policies, and problems.

4. EPI SUPERVISORS MONTHLY MEETING- All 10 district EPI Supervisors come to Peshawar/Quetta and meet with the EPI Deputy Director to discuss EPI policy, plans, problems, and are also provided continuing EPI education.

DISTRICT LEVEL

1. FSMO VOLAG MONTHLY MEETING: The FSMO meets monthly with the voluntary agencies in his district to coordinate health activities.

2. FSMO MONTHLY MEDICAL OFFICER MEETING: The FSMO meets monthly with his medical staff for training, policy, planning, and problem solving on health related issues.

3. VACCINATOR MONTHLY MEETING: The EPI Supervisor meets monthly with his vaccinators to provide new information on EPI, continue field training, and solve problems encountered in the field.

BHU LEVEL

1. BHU MONTHLY STAFF MEETING: All BHU medical staff meet monthly for training, and to discuss new policy implementation and field problems.

18. EVALUATION

Every EPI Programme must have built in a system to evaluate itself. It is necessary to evaluate both the **PROCESS** of your programme and the **IMPACT** of your programme.

18.1. PROCESS EVALUATION

Process evaluation means looking at your programme **INPUTS** or how you are delivering the EPI programme. If the supervisory system is working well, you are in fact evaluating the process of your programme. The supervisory checklist used in the EPI programme is **PROCESS EVALUATION**. It indicates if each person is doing their job and the quality of the job that is being done. The EPI program is evaluated through the supervisory checklist with the following categories:

1. Vaccine Storage/Refrigeration
2. Store Supplies/Equipment
3. Surveillance Reporting
4. Records/Displays
5. Sterilization
6. Organization of Immunization Site
7. Immunization Performance/Technique
8. Recording at EPI Sessions
9. Vaccine Handling at EPI Sessions
10 Communication/Health Education
11 Community Participation

To have an idea how well the EPI process is working and to discover the weak points in the programme, once a year a Programme Review should be carried out using the supervisory checklist pro-formas and compiling the results. This review should be done:

- by 5-10 independent observers
- over a 1-2 week period
- each observing:
    * 1-2 FSMO districts
    * 2 BHUs per FSMO
    * 2 mobile teams per FSMO

Along with the PDH and EPI Deputy Director, other Deputy Directors can assist with this evaluation. FSMOs can also be involved to evaluate each other, or medical officers from different districts can be involved in this process. All should be familiar and briefed as to the expected and acceptable standards of evaluation.

Recommendations and changes in the programme can be implemented on the basis of this review process.

18.2. IMPACT EVALUATION

To evaluate the impact of the EPI program, one must look at the **OUTCOME** of the program. The desired outcome of EPI is to reduce and eliminate the 6 target EPI diseases by vaccinating 100% of the target population. Therefore these two indicators are measuring EPI impact:

1. Number of reported EPI Diseases
2. Vaccination Coverage

A good surveillance system will measure the final impact of the EPI programme. The reported cases of the 6 EPI diseases reported should be compared yearly. (See CHAPTER VXIII. on SURVEILLANCE)

Coverage can be estimated through 3 methods:

1. Programme calculation of coverage
2. 75 household coverage surveys (for specific camps)
3. 30 Cluster coverage surveys (for district/province)

18.3. CALCULATING COVERAGE RATES BASED ON IMMUNIZATION RETURNS

This is probably the least accurate way of evaluating coverage as it is dependent on knowing the true population which is difficult, especially with a refugee population that is constantly moving. Coverage for each vaccine can be done as well as the last vaccine given, either Measles or DPT/Polio, indicating those fully immunized. First one must calculate the target population as follows:

TARGET POPULATION

* The target population is the number of people who must be immunized. For example our program targets children under age 1 and women who are pregnant as well as between the ages of 15-45. To plan your programmme and work, you must know how many people you have to reach.

1. Number of children under 1 year of age:

* Tells you how many children you will have to vaccinate in one year. Divide by 12 to know how many you must vaccinate in one month to set your work goals for the month. This is based on the assumption that the birth rate is 37 births per 1000 population per year.

* The number of pregnant women per year will be slightly higher than the number of children under age 1 for the year. This is based on the following assumption:

Total population x 0.045 = Number of pregnancies Total population x 0.037 = Number of children under 1

Example: 10,000 population x 0.037 = 370 children under 1

2. **Number of women age 15-45:**

* Tells you how many women you must vaccinate in one year. It is based on the assumption that 22% of the population are women between the ages of 15-45.

Total population x 0.22 = Number of women age 15-45

Example: 15,000 population x 0.22 = 3,300 women age 15-45

PERCENT (%) COVERAGE

* Coverage is the most important thing for you to know. It tells you what proportion or part of your target population has received vaccination. Your job is to reach 100% of your target. Number of doses alone does NOT tell you what part or % has been vaccinated.

$$\frac{\text{Number of doses of vaccine given in one year}}{\text{Target population}} \times 100 = \%\ \text{coverage}$$

1. BCG COVERAGE:

* BCG COVERAGE gives you an idea of percent of the total children under age 1 who have had contact with the EPI programme.

$$\frac{\text{Number of BCG doses given in one year}}{\text{Number of children under 1}} \times 100 = \%\ \text{BCG coverage}$$

Example:

$$\frac{\text{4159 doses BCG given}}{\text{7349 children under 1}} \times 100 = 56.6 \text{ or } 57\%\ \text{BCG coverage}$$

* Therefore 56% of the target children under age 1 year has been reached by the EPI programme at least once.

2. MEASLES COVERAGE:

The same method can be used.

3. DPT 1/POLIO 1 COVERAGE:

* DPT 1 or POLIO 1 gives you an idea of what part of the district have started their series of immunizations. You can use this number later in the formula to calculate what part of your district has dropped out.

$$\frac{\text{Number of DPT 1 or POLIO 1 given in 1 year}}{\text{Number of children under 1}} \text{ x100} = \text{ \% DPT 1 or POLIO 1 coverage}$$

Example:

$$\frac{\text{7200 DPT 1 given}}{\text{7878 children under 1}} \text{ x 100} = \text{91.39 or 91\% DPT 1 coverage}$$

4. DPT 2/POLIO 2 COVERAGE:

The same method can be used.

5. DPT 3/POLIO 3 COVERAGE:

* DPT 3 and POLIO 3 coverage gives you a good idea what part of your target population has finished their 3 dose series. You can use this number later in the formula to calculate what part of your district has dropped out.

$$\frac{\text{Number of DPT 3 or POLIO 3 given in 1 year}}{\text{Number of children under 1}} \text{ x 100} = \text{ \% DPT 3 or POLIO 3 coverage}$$

Example:

$$\frac{\text{5870 DPT 3 given}}{\text{7878 children under 1}} \text{ x 100} = \text{74.51 or 75\% DPT 3 coverage}$$

* Therefore 75% of the children have finished DPT.

6. TT 1 COVERAGE:
* TT 1 coverage gives you an idea of what part of your district services have reached women for vaccination. You can use this number later in the formula to calculate what part of the women in your area have dropped out.

$$\frac{\text{Number of doses of TT 1 given in one year}}{\text{Number of women 15-45}} \times 100 = \text{\% TT 1 coverage}$$

Example:

$$\frac{\text{11,950 TT1 given}}{\text{15,296 women 15-45}} \times 100 = \text{74.92 or 75\% TT1 coverage}$$

7. TT 2 COVERAGE:

* TT 2 coverage gives you an idea of what part of the women age 15-45 have completed their basic TT immunizations. You can use this number later in the formula to calculate what part of the women in your district have dropped out.

The method as TT1 coverage can be used.

18.4. IMMUNIZATION COVERAGE CHARTS

Coverage may be estimated monthly and yearly with the visual aid of an immunization coverage chart. This is also not very accurate as again it depends on knowing the true number of the target population. It can be used for each vaccine alone or a series of 3 as in the three-dose vaccines of DPT and Polio.

1. Fill in the top part of the chart according to your area, vaccine coverage that you are monitoring, and target population.

2. Fill in left side "number of children" (or women) to be immunized:

   * Calculate the target population, write by Target Population
   * Divide this number by 12 for each months' target number.
   * On the left side of the chart, write 0 on the first line
   * Move up one space and put the number for two months's targets (Monthly target x 2)
   * Move up one space and put the number for three month's targets (monthly target x 3)
   * Continue until you reach the top line, here put your total target population number for the year (may be more or less than monthly number x 12)

3. Write the months of the year from January to December on the bottom of the chart.

4. For each vaccine at the bottom there are 2 boxes:

   * In the first box write the number of doses given that month only.
   * In the second box "cumulative total for year" write the total number given for the year so far. That means the number from all previous months added to this month

5. Draw the lines on the chart:

   * Find the line that goes up the chart at the end of the month.
   * Go up the line until you are opposite the number on the target number scale that is the same as your cumulative total for the vaccine that month.
   * Put a dot here.
   * Join this dot to the last dot.

6. See what % line your cumulative total is near.

TT 1	FIRST CONTACT	
TT 2	AFTER 1 MONTH	
TT 3	AFTER 6 MONTHS	(OR NEXT PREGNANCY)
TT 4	AFTER 1 YEAR	(OR NEXT PREGNANCY)
TT 5	AFTER I YEAR	(OR NEXT PREGNANCY)

* VACCINES ARE SAFE IN PREGNANCY AND IN MILD ILLNESS

* IMPORTANCE OF EPI CARD

* TARGET GROUPS/DEFAULTERS
  - Bring to BHU/Mobile Teams
    1. newborne and infants
    2. pregnant women
    3. defaulters [show pictorial EPI cards]

* TIME AND PLACE IMMUNIZATIONS ARE AVAILABLE
    1. collecting points-when
    2. BHU hours
    3. plan for most convenient time for families

EPI INFORMATION FOR FAMILIES AT EPI SESSION

* Give information after administering each vaccine
* Identify vaccine and the disease it protects against
  [SHOW PICTURE OF TARGET DISEASE]
* Explain side effects
  [SHOW BCG SCAR PICTURE AFTER GIVING BCG]
* Mark card and explain doses still needed
  [USE EPI CARD PICTURE]
* Give next vaccine/explain disease/side effects/mark card
* Explain when team will return
  [SHOW PICTURE OF EPI SCHEDULE]
* Remind about keeping EPI card and bringing it to sessions or to BHU when visiting for any reason.

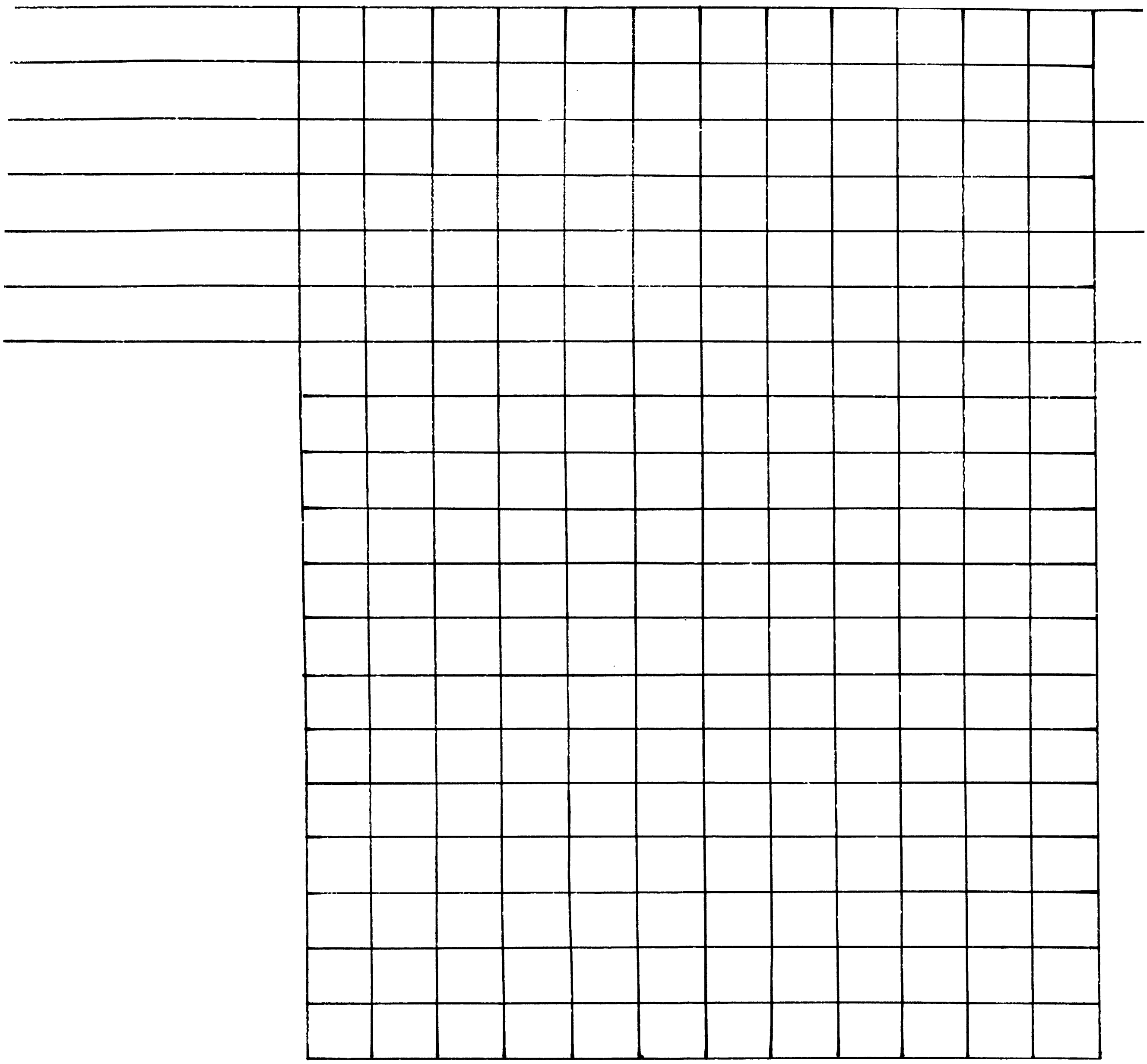
(See Disease Chapters of specific messages about the diseases, vaccine side effects.)

VISUAL AIDS AVAILABLE AT HERC AND PDH/EPI OFFICE

* Silk screen flip charts for group meetings/general EPI information

* Plastic laminations-for group meetings/dai training/EPI sessions:
  1. EPI Schedule
  2. Measles
  3. Polio
  4. Diphtheria/Pertussis/Tetanus
  5. TB

Fig. 18.1 **SAMPLE IMMUNIZATION COVERAGE CHART**



18.5 SURVEYS

A. THE 75 HOUSEHOLD SURVEY

The 75 Household Survey will provide you with information about the status of immunization series in areas very close to the BHU.

It will tell you:

* coverage of those CLOSEST to your services (BHU)
* number who have never been reached
* number of drop outs
* why people do not go or return for immunizations
* how people feel the services can be improved

It will not tell you:

* overall coverage
* overall reasons for failure to be immunized

IT DOES NOT REPRESENT YOUR POPULATION BUT GIVES YOU AN IDEA AS TO WHAT THE PROBLEMS COULD BE IN YOUR PROGRAMME AS THE COVERAGE SHOULD BE BEST CLOSEST TO YOUR BHU.

Follow these steps:

1. Plan the survey:

a. Prepare a questionnaire that can be used by interviewers and a tally sheet that you will use to compile the data. See samples on the following pages.

2. Collect and compile the data:

a. Visit 75 households that are closest to your BHU. They do not have to be randomly selected, and can be interviewed in order.

b. Check the immunization status of each member in the household who is under 2 or 15-45 and mark on the form full, partially, or not immunized.

c. For those not fully immunized, each woman should be asked to give one reason for not going for immunization for each child under age 2 and for each woman 15-45 who lives in the household. Each woman should also be asked her opinion on how to improve the health services.

d. Tally the results on the Tally Sheet for the 75 Household Survey and total the number of responses to each question.

e. Total the number of women and children in the study by adding up the total for Item A (Fig. 18-3). Record the total in the appropriate space on the form.

3. Analyze the data:

a. Identify the number who are never reached and drop outs by reviewing the tally sheet.
   * "not immunized" = never reached
   * "partially immunized" = drop outs
   * "fully immunized"= remaining women/child

Compare these numbers to obtain more information about the problem.

EXAMPLE:

The tally sheet (Fig. 18-3) shows that:
22 people never reached
84 were drop outs
18 were fully immunized

This tells you that the majority of women and children visit the BHU but the biggest problem is drop outs.

b. Investigate why the women and children were not fully immunized. Make a list of all the reasons given and see which three are given most frequently.

EXAMPLE:

Look at the tally sheet (Fig. 18-3). Three reasons given most often were:

1.	Time of immunization inconvenient	36
2.	Unaware of the need to return	12
3.	Long waiting time	12

If you can solve just these three problems, you can greatly improve your services and potentially the coverage.

4. Take action.

Use this information to modify your program strategy.

* Discuss with women and staff a more convenient time and reschedule immunization sessions accordingly.

* Emphasize health education messages to focus on the EPI schedule by mass media announcements, CHW/FHW training, and vaccination health education training supplemented with visual aids.

* Discuss ways to decrease waiting time with staff, such as offering more times and locations for immunization sessions or increasing the staff for each session. Implement these plans.

Fig. 18-2. **SAMPLE QUESTIONNAIRE FOR THE 75 HOUSEHOLD SURVEY**

Sample Questionnaire for the 75 Household Survey

Household number:__________ Health centre:__________

* Complete one questionnaire per household

Name of children less than 2 years of age and women of childbearing age	Not immunized	Partially immunized	Fully immunized	Reason woman or child did not go, or did not return, for immunization. OR, woman's recommendation on how immunization services could be improved.
				The health centre is open at inconvenient hours --
Ayo Mbaye				open it in the evening not sure when to return for additional
Annamma Mbaye				immunizations health workers should explain why immunization
Dariga Mbaye				is important and when to return
SUBTOTAL:				

Signature interviewer:__________

Date of interview:__________

Fig. 18-3. TALLY SHEET FOR THE 75 HOUSEHOLD SURVEY

Tally Sheet for the 75 Household Survey

Health centre____________________ Date of questionnaire________________

Number of Households interviewed________________ Number in the study________________

Response	Place tally marks here	Total
A. Not immunized	卌 卌 IIII 卌 II 22	
Partially immunized	卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 IIII	84
Fully immunized	卌 卌 卌 III	18
B. Unaware of need for immunization	II	2
Unaware of need to return for 2nd or 3rd dose	卌 卌 II	12
Place and/or time of immunization unknown	卌	5
Fear of side reactions	IIII	4
Wrong ideas about contraindications	卌 III	8
Postponed until another time	II	2
No faith in immunization	II	2
Rumours		0
Place of immunization too far	卌 I	6
Time of immunization inconvenient	卌 卌 卌 卌 卌 卌 卌 I	36
Vaccinator absent	III	3
Vaccine not available	III	3
Mother too busy	卌 III	8
Family problem, including illness of mother	卌	5
Child ill - not brought	卌 III	8
Child ill-brought but not immunized	II	2
Long waiting time	卌 卌 II	12
Other	卌 I	6
C. Suggestions for improvement		

B. THE 30 CLUSTER EPI COVERAGE SURVEY

The 30 Cluster EPI Coverage Survey gives you the best information on your overall EPI coverage for a large area.

This method requires that you know your population by areas. For example:section populations within a camp.
camp populations within a district.
district populations within a province.

The following method is used:

1. Select your Clusters

Make a list of your sectors, their population, and cumulative population.

Sector	**Population**	**Cum Population**
Sector A or Camp	100	100
Sector A or Camp	180	280
Sector A or Camp	50	330
Sector A or Camp	103	433
Sector A or Camp	155	588
Sector A or Camp	170	758
Sector A or Camp	133	891
Sector A or Camp	309	1200
Sector B or Camp	156	1356
Sector C or Camp	44	1400
Sector D or Camp	150	1550
Sector E or Camp	140	1690

Divide your total population by 30 to get your sampling interval.

$$\frac{1690}{30} = 56 \qquad \frac{\text{Total Population}}{\text{30 clusters}} = \text{Sampling interval}$$

Randomly chose a number between 0 and your sampling interval number, in this case 56. Let us use 40. The number 40 will be used to randomly choose your 30 clusters within the sectors, or camps, districts as follows.

Determine where to find your clusters by calculating the population cluster numbers. For cluster 1 you use your random number. For cluster 2 add the random number to the sampling interval number. For cluster 3 to 30 add your sampling interval number to the last cluster population cluster number.

Then identify the sector, camp, or district in which your clusters should be found. This is done by finding which cluster number can be found in the cumulative population number of the sector.

A "cluster" must contain 7 children under age 1 year and 7 women between the ages of 15-45.

So if you go to Sector "A" you would randomly go to one house, then house to house until you found 7 from each group.

For cluster 1 you would randomly select a different house as your starting point from a different area of the sector and follow the same house-to-house pattern until you found 7 from each target group.

In total you will survey 210 (30 x 7 = 210) from each of your target groups.

2. Collect and Compile the Data:

The same data as the 75 household survey is gathered in the 30 cluster EPI Coverage Survey. See the following pages for examples of the pro-formas.

3. Analyze the data/Take action:

Follow the same procedures as you have done for the 75 household survey in data analysis using the tally sheet and results pro-formas. Develop a plan of action with your staff and **IMPLEMENT** it.

* For more information on the 30 Cluster EPI Coverage Survey see the WHO publication on COVERAGE SURVEY.

18.6. PROBLEMS WITH COVERAGE AND SOLUTIONS

If according to your surveys you find that the coverage is less than your goal you must investigate the causes. There are generally 4 major reasons:

1. Drop outs
2. Never reached
3. Missed opportunities
4. Lack of geographical access

A. HOW TO CALCULATE DROP OUT RATES

* Drop out rates give you an idea of what parts of your district are not completing their immunizations. There are two causes for drop outs:

1. The EPI program is not reaching them.
2. Refugees are refusing EPI.

THE DROP OUT RATE SHOULD BE LESS THAN 10%

1. PROGRAM DROP OUT %:

* BCG DOSES and MEASLES DOSES are used in calculating this rate. BCG is usually the first immunization and Measles the last. Therefore comparing the two gives you an idea of the difference between the number who start the programme and the number who finish the programme. This gives you an OVERALL idea about drop outs in your whole programme to vaccinate children.

$$\frac{\#\ \text{BCG DOSES} - \#\ \text{MEASLES DOSES}}{\#\ \text{BCG DOSES}} \times 100 = \text{PROGRAMME DROP OUT \%}$$

Example:

$$\frac{4151\ \text{BCG} - 2699\ \text{Measles}}{4151\ \text{BCG}} = \frac{1452}{4151} = .3497 \times 100 = 34.97 \text{ or } 35\% \text{ programme drop out}$$

* Therefore 35% of children have not followed through with the EPI program and have not been followed up.

2. DPT or POLIO DROP OUT %:

* DPT and POLIO drop outs give you an idea of what part of the children in your district are failing to complete DPT or Polio vaccination. This lets you know if your program needs to spend more time in following up defaulters.

$$\frac{\#\ \text{DPTI DOSES} - \#\ \text{DPT 3 DOSES}}{\#\ \text{DPT 1 DOSES}} = 100 = \text{DPT DROP OUT\%}$$

Example: (For DPT)

$$\frac{7200\ \text{DPT1} - 5870\ \text{DPT3}}{00\text{DPT1}} \quad \frac{1330}{7200} = .1847 \times 100 = 1847 \text{ or } 18\% \text{ DPT drop out}$$

* Therefore 18% of the children have not finished their DPT vaccinations and have not been followed up

$$\frac{\text{\# POLIO 1 SOSES - \# POLIO DOSES}}{\text{\# POLIO 1 DOSES}} \times 100 = \text{POLIO DROP OUT\%}$$

Example:

$$\frac{\text{7210 POLIO 1 - 5227 POLIO 3}}{\text{210 POLIO}} = \frac{1983}{7210} \quad .2750 \times 100 = 27.50 \text{ or } 28\%$$

* Therefore 28% of the children have not finished their Polio vaccinations and have not been followed up.

3. TT DROP-OUT %:

* TT drop out % gives you an idea of what part of the women in your district are dropping out of your program for women and not completing their immunizations. This lets you know if your program needs to spend more time in following up women defaulters.

$$\frac{\text{\# TT 1 DOSES - \# TT 2 DOSES}}{\text{\# TT 1 SOSES}} \times 100 = \text{TT DROP OUT\%}$$

Example: (For TT)

$$\frac{\text{11950 TT 1 - 5260 TT2}}{\text{1190 TT 1}} = \frac{6690}{1190} = .5466 \times 100 = 55.98 \text{ or } 56\% \text{ TT drop out}$$

* Therefore 56% of women have not completed their TT vaccinations and have not been followed up.

B. DROP-OUTS (PARTIALLY IMMUNIZED) AND NEVER REACHED (NOT IMMUNIZED)

* If you find that your programme has a large number of drop outs or never reached you must look for the reasons. The information gathered from the "Reasons for Immunization Failure" survey will answer most of these questions. These are the categories for immunization failure:

1. LACK OF INFORMATION

a. Unaware of need
b. Unaware of need for 2nd/3rd dose
c. Place/time unknown
d. Fear of side effects
e. Wrong ideas about contraindications

2. LACK OF MOTIVATION

a. Postponed to another time
b. No faith in EPI
c. Rumors

3. OBSTACLES

a. Place of immunization too far to go
b. Time inconvenient
c. Vaccinator absent
d. Vaccine not available
e. Mother too busy
f. Family problem
g. Child ill-not brought
h. Child ill-refused vaccine
i. Long waiting time
j. Not 1 month between doses
k. Child not 9 months when measles vaccine given
l. Migration

These problems can be grouped together in a different way in order to find ways to solve the problems. They are problems that can be solved by:

* revisions in the EPI programme management strategy
* improvements in EPI health education of the public
* vaccinator EPI refresher training

Many of the problems can be solved by **INVOLVING THE COMMUNITY** through group meetings with:

* Community leaders: maliks, mullahs, elders
* School teachers and students
* Mothers

6. BCG scarring
7. Neonatal and Maternal Tetanus
8. Clean delivery practices

* Other posters/flip charts.

3. COMMUNITY INVOLVEMENT

Your EPI job will become much easier if **YOU BECOME INVOLVED** with the community that you are serving. You must learn as much as you can about the community. The community is a great RESOURCE to help you get the job done in EPI. First identify the groups and leaders in the community.

COMMUNITY RESOURCES

* Mullahs
* Maliks/group leaders
* Social Workers
* School Teachers
* School Children
* RVAs
* Health Committee
* Community Health Workers

Next organize a meeting with these groups in the BHU or inside the RV. **Get to know them and give them the opportunity to know YOU.** Allow them the opportunity to be involved in the EPI program. If they help with the planning, they will trust and use the EPI services more. Explain the program and get THEIR ideas of how you TOGETHER can reach the goals of EPI. (See "EPI Information for Group Meetings Guidelines" on how to explain EPI)

CONDUCTING COMMUNITY MEETINGS

* Introduce self and purpose of meeting
* Present information on EPI
* Ask and answer their questions on EPI
* Present your EPI program problems
* Ask them for their ideas on solutions
* Ask them what are their problems with EPI
* Discuss solutions to these problems
* Make a plan of action
    -tasks to be done
    -who will do them
    -when they will do them
    -how they will do them

Here are some ideas on how the community can help with EPI:

* Health Education

C. PROBLEMS REQUIRING EPI PROGRAM MANAGEMENT SOLUTIONS

Problem	Solution
1. Time and place unknown	1. Pre-schedule EPI sessions with community leaders and announce them
2. Place of immunization too far to go	2. Decide with community leaders convenient collection points
3. Time inconvenient	3. Meet with staff and community and jointly decide on best times for EPI sessions.
4. Vaccinator absent	4. Plan better staffing coverage
5. Vaccine not available	5. Review vaccine needs/ordering and delivery schedules with staff and upper levels. Amend procedures.
6. Long waiting time	6. Discuss with staff and plan more collecting points or reorganize to increase size of teams.
7. Migration	7. Plan mass campaigns

D. PROBLEMS REQUIRING GREATER EPI EDUCATION OF POPULATION

1. Unaware of need 2. No faith in EPI	1.2. Group meetings, school health education programmes, and individuals health education about what immunizations do through leaders, CHW/FHW, BHU staff.
3. Unaware of need for 2nd/3rd dose	3. Education about dose requirements at group meetings, schools, through CHW/FHW, and vaccinators.
4. Place/time unknown	4. Public announcements through mosque and at EPI sessions.
5. Fear of side effects	5. Side effects explanation at EPI sessions, at schools, group meetings, and via CHW/FHW.

6. Wrong ideas about contraindications 7. Child ill-not brought	6.7.Emphasis on "no contraindications" messages at EPI sessions, schools group meetings, and via CHW/FHW.
8. Rumors	8. Identify existing rumors and misconceptions in meetings with leaders & mothers correct them through question and answer sessions.

E. PROBLEMS REQUIRING MORE STAFF RE-EDUCATION

Problem	**Solution**
1. Unaware of need for 2nd/3rd dose	1. Train staff on how to deliver health education messages with visual aids to supplement the message.
2. Place/time unknown	2. Train staff on scheduling EPI sessions and include announcement of session sites and time as part of health education message during EPI sessions.
3. Fear of side effects	3. Retrain staff on side effects & train staff on how to deliver the correct health education message.
4. Wrong ideas about contraindications	4. Retrain staff on contraindications & train staff on how to deliver the correct health education message.
5. Vaccine not available	5. Train staff on how to calculate daily vaccine vial requirements for EPI sessions.
6. Not 1 month between doses	6. Emphasis on 1 month intervals in training.
7. Child not 9 months when measles vaccine given	7. Train staff to use date of birth not age. Provide calendars.

F. MISSED OPPORTUNITIES

Missed opportunities occur when mother or child needing immunization are using the BHU but are **not** vaccinated by the BHU staff.

For example, if a woman brings a child who is sick with diarrhea to the BHU, both she and the child **should be screened for immunization and then immunized if they are eligible.**
If this does not occur, then the health worker has "missed an opportunity" to immunize them.

UNICEF estimates world-wide that, if every woman and child is screened and immunized when they seek services in health centers, coverage would automatically be 80%

DO NOT MISS ANY OPPORTUNITY TO VACCINATE ANY ELIGIBLE WOMAN AND CHILD WHEN THEY COME TO THE BHU FOR ANY REASON

Missed opportunities is big reason for poor EPI coverage.

Why is it important to offer EPI at the BHU:

* EPI is an ESSENTIAL part of Maternal-Child Health.

* People must learn that it is better to PREVENT diseases before they occur rather than treating them later. If EPI is a part of the BHU activities people will understand this concept better.

* Preventing disease is everyone's job therefore EPI is the responsibility of all health worker staff.

* Giving a vaccine, like dispensing other kinds of treatments, requires no more time and potentially saves time and lives in the future, diminishing BHU work.

* If families become dependent on outreach teams for EPI services, they are not taking responsibility for their own health. Offering EPI services at the BHU allows families to come on their own and be better in control of their own health.

* If the outreach teams miss a family, they should have a place to go where vaccines are always available.

Who is responsible for giving immunizations:

* Medical officers
* LHVs
* Dispensers
* Vaccinators

ALL BHU HEALTH PROVIDERS

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* House Numbering
* Identifying Collecting Points
* Scheduling Mobile Team Visits
* Notifying Community of Time of EPI Sessions
* Bringing Target Groups to Collecting Points
* Crowd Control at EPI Sessions
* Finding Defaulters
* Finding Newborns
* Finding Pregnant Women
* Carrying Equipment
* Organizing Mass Campaigns

4. CONDUCTING AN EPI SESSION

4.1. NECESSARY EQUIPMENT

First calculate how many people you expect to immunize at the session from:

1. Old records.
2. Number of households x 7 = population

Population x .037 = Number of children under 1

Population x .22 = Number of women 15-45

1. VACCINES

Bring enough vials for the number of doses you expect to give allowing for 25% wastage for all the vaccines except BCG. (Allow 50% wastage).

> for example, if 17 children are expected at the session.
>
> Calculate wastage for DPT/Polio/Measles vaccines:
> Expected children x wastage = additional doses required
> 17 x 0.25 = 4.25 or 5
> No. doses needed = No. of children + additional doses =
> 17 + 5 = 22 doses
> Bring: 2 vials Polio, DPT,
> 3 vials of Measles
> Example for BCG:
> Expected children = 17 x 0.50 = 8.5 or 9
> No. doses needed = 17 + 9 = 26 doses
>
> Bring: 2 vials of BCG

CHECK THE EXPIRATION DATE ON EACH VIAL.

Vaccine	Doses/Container	Precautions
BCG	20/ampule	* Protect from light
Polio	20/bottle	
DPT	20/vial	* Protect from freezing
Measles	10/vial	* Protect from light if vial is clear glass
TT	20/vial	* Protect from freezing

2. VACCINE CARRIER

* 1 Carrier for each team

Kinds of Carriers	No. Ice Packs(size)
Beige small carrier (RCW-2)	2 Ice Packs (300ml)
White with Blue top (Spa)	7 Ice Packs (400ml)
Grey square carrier (Thermos)	4 Ice Packs (300ml)

* Piece of foam with holes for top of carrier
* Protect vaccine labels from getting wet
* Wrap DPT/TT in foam or newspaper to protect from freezing
* NEVER PUT CARRIER IN THE SUN

***KEEP LID CLOSED AT ALL TIMES**

3. DISPOSABLE SYRINGES AND NEEDLES

ONE STERILE NEEDLE AND ONE STERILE SYRINGE FOR EACH INJECTION

The table below shows the numbers of needles and syringes you will need based on the number of women and children who need vaccination plus extras in case of contamination.

	No. Children Expected							
(up to)	10	20	30	40	50	60	80	100
5 ml syringes	3	3	3	3	3	3	3	3
Mixing needles	3	3	3	3	3	3	3	3
1 ml syringes	10	20	30	40	50	60	80	100
IM/SC needles	10	20	30	40	50	60	80	100
BCG Syringes	5	10	10	10	15	15	20	20
BCG needles	5	10	10	10	15	15	20	20

	No. Women Expected							
(up to)	10	20	30	40	50	60	80	100
1 ml syringes	10	20	30	40	50	60	80	100
IM/SC needles	10	20	30	40	50	60	80	100

4. COTTON/SPIRITS-in a jar
5. SOAP
6. STERILIZER/PLASTIC BOWL
7. PLASTIC BAG-for trash
8. METAL FILE TO OPEN AMPULES
9. FOIL TO COVER CLEAR GLASS MEASLES AND BCG AMPULES
10.EPI CARDS
11.PERMANENT REGISTER
12.DAILY REGISTER
13.PLASTIC HEALTH EDUCATION PICTURES

4.2. EPI SESSION SITES

Immunization sessions should be held in 3 different sites:

1. Fixed centers: at BHU
2. Collecting points: for children, women not in purdah
3. Household compounds: for women in purdah

BHU: All women and children must be screened for their EPI status. Anyone due for a vaccine must be sent to the LHV or Dispenser or vaccinator for immunization.

LHV:-TT to all pregnant women aged 15-45 women
-Polio 0 and BCG to newborns
-Other vaccines for any child she sees who needs it

DISPENSER: Any vaccine required for a child

COLLECTING POINTS: Collecting points must be:

* arranged in advance with the community leaders
* announced to community, place and time
* well lit, protected from sun/rain/dust, and clean
* have a waiting area

HOUSEHOLD COMPOUNDS: Vaccination site should be:

* light, protected from sun/rain/dust, and clean
* have a waiting area

4.3. ORGANIZING SESSION SITE

* Put your vaccine carrier in the coolest place
* Ask people to find community leader or CHW
* Ask volunteer to go door-to-door to bring in children
* Ask leader or CHW to organize waiting area
* Wash your hands
* Prepare your vaccines
    -check expiration date

-write today's date on all vials
-reconstitute BCG/Measles only when a case arrives

* Review EPI card/history of past vaccines/BCG Scar
* Enter information into registers
* Circle on EPI card required vaccines
* Give vaccines with health education after each dose:
  - o explain target disease with picture
  - o explain side effects
* Recap disposable syringe and put in rubbish bag

NEVER LEAVE A SYRINGE UNCAPPED. YOU COULD PRICK YOURSELF WHEN COLLECTING YOUR USED EQUIPMENT AND GET HEPATITIS FROM A DIRTY NEEDLE.

* Irrigate and soak reusable syringes and needles after each injection

IT IS VERY DANGEROUS TO NOT IRRIGATE AND SOAK REUSABLE EQUIPMENT IMMEDIATELY AFTER USE. VACCINES AND BLOOD WILL HARDEN INSIDE AND NOT COME OFF LATER MAKING STERILIZATION DIFFICULT

* Enter dates on EPI card and mark on picture side, explaining about:
  - o doses still required
  - o when you will return/when to go to BHU for doses
  - o safe-keeping of card

* Mark dates on Growth Monitoring Card and Antenatal Card if available.

4.4 CLOSING EPI SESSION

AT SESSION SITE:

* Return all borrowed equipment
* Pour out all unused BCG on the ground in the sun
* Put used vials/ampoule in rubbish bag.

DO NOT LEAVE ANY VIALS ON THE GROUND. THEY MAY BREAK AND CUT SOMEONE'S FEET OR A CHILD MAY PUT THE GLASS INTO ITS MOUTH.

* Count the number of injections given
* Count the number of syringes/needles in your rubbish bag
* These numbers should be equal

IF THEY ARE NOT THE SAME DO NOT END THE SESSION UNTIL YOU HAVE RECOVERED ALL USED SYRINGES AND NEEDLES.

* Collect all syringe wrappers, cotton and put in rubbish bag.

AT BHU

* Burn all disposable needles and syringes:
  - in a place protected from children
  - be sure they are **completely** burned
* Throw out any vials that have been **opened**
* Check your thermometer in your vaccine carrier

If between 0 to +8C	: Return vaccines to refrigerator
	: Put in RETURNED BOX
	: Use them FIRST next time
	: Use only 3 days in a row
If more that +8C	: Dispose of vaccine
If less than 0C	: Perform shake test on DPT/TT
	: If positive, throw away

* Return ice pack to freezer
* Wipe out vaccine carrier and leave the lid off
  -report any cracks to EPI supervisor
* Clean reusable syringes and needles and load sterilizer

EPI Manual

INDEX

5. IMMUNITY

5.1. ORIGINS OF EPI DISEASES

Diseases are caused by MICROBES. These are very small living organisms (so small that we often cannot see them with the human eye) that invade the body and cause infections.

Microbes can **live everywhere** in the environment.

-in the soil (tetanus spores)
-in the stool (polio)
-in sputum (TB)

There are different FAMILIES OF MICROBES:

PARASITES

-Small animals
-Male and female
-Examples: scabies
worms
malaria

FUNGUS

-like small plants
-example: thrush in babies
hyphae

BACTERIA

-small but visible under microscope
-soft wall
-killed by antibiotics
-example: Abcesses

VIRUS

-smallest, cannot see
-antibiotics cannot kill
-example: Common cold

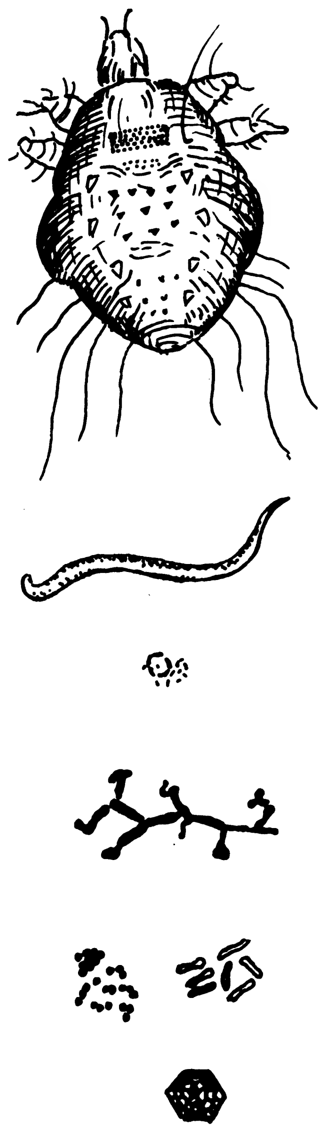


Fig. 5-1: Family of Microbes
Source: Primary Child Health

The EPI diseases are caused by:

* Viruses

  -Measles
  -Polio

* Bacteria

  -Tuberculosis
  -Pertussis

* Toxins (poisons) produced by bacteria

  -Tetanus
  -Diphtheria

5.2. TRANSMISSION OF EPI DISEASES

These microbes get into the body or are transmitted from person to person by:

* Air: breathing in tiny **water droplets** that contain microbes from a sick person who coughs, sneezes, or spits. Examples:

  PERTUSSIS
  TB
  MEASLES
  DIPHTHERIA

* Mouth: Contaminated water, food, or hands dirty with stool that has the microbes. Example:

  POLIO

* Skin: Deep cuts or dirty wounds become infected with microbes which then enter the blood. Example:

  TETANUS

* Blood: Cutting the umbilical cord with an unsterile knife or covering the cord with paste made from animal dung allows microbes to enter the blood.

  NEONATAL TETANUS

5.3. DEFINITION OF IMMUNITY

Immunity means that a person is PROTECTED from getting sick from a disease. There are 4 ways a person can become immune:

1. From having the DISEASE.
2. From having a VACCINATION for the disease.
3. From MOTHER's blood during pregnancy if she is immune.
4. From an injection of manufactured ANTIBODY.

5.4. DISEASE IMMUNITY

There are many diseases a person will get only once because the body becomes immune after the first infection. It happens like this:

1. Microbes enter the body.
2. Body notices that a foreign microbe **(ANTIGEN)** has invaded the body.(like the Soviets invading Afghanistan)
3. The body builds up an army **(ANTIBODIES)** to fight this foreigner.(like the mujahadeen)
4. The army **(ANTIBODIES)** fights the foreign microbes (ANTIGENS) and eventually kills them.
5. The army **(ANTIBODIES)** stays in the body and is ready to fight the same foreign microbes if they try to enter the body again. (See Figure 5-2.)

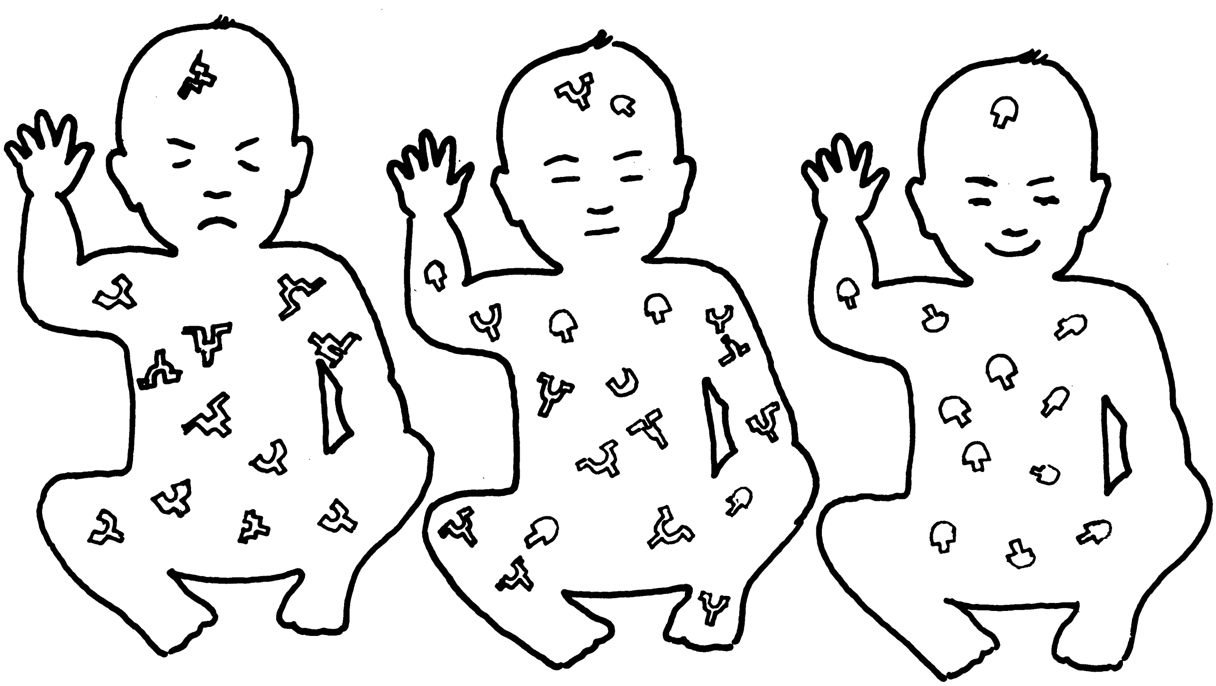


Fig. 5-2.
Disease Immunity: Adapted from Primary Child Health (The first picture shows a child who's body has been invaded by microbes (Y shapes). In the second picture the body has produced antibodies (mushroom shapes), and in the third picture the antibodies have destroyed all the microbes, and stay in the body to protect it.)

5.5. VACCINE IMMUNITY

Vaccines are dead or weakened microbes and toxins that cannot harm the person. When we give a vaccine we are fooling the body into thinking that the real, dangerous microbe has entered into the body. (See figure 5.3. below). It is like a sheep disguised in a wolf's clothing. Therefore the body manufactures and mobilizes the same army of **ANTIBODIES** to fight this foreign invader just like it would if the actual disease microbe had invaded. The antibodies also stay in the body the same as if the person had had the real disease.

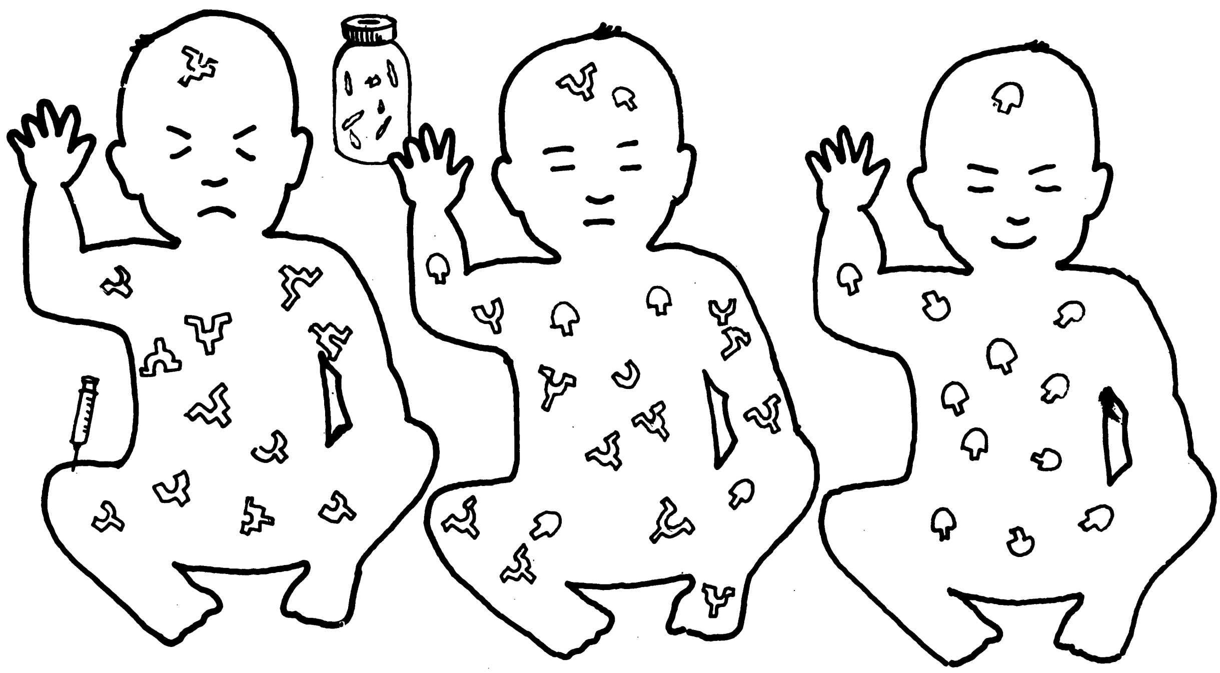


Fig. 5.3. Vaccine Immunity: Adapted from Primary Child Health (In this figure the syringe and needle is showing that the child has been immunized.)

5.6. MATERNAL IMMUNITY

If the mother has had one of the EPI diseases or has had an EPI vaccine, she had made antibodies against these diseases.

ANTIBODIES LIVE IN THE BLOOD

When she is pregnant and carrying a child inside, the baby gets its blood from the mother. Therefore the baby also gets some of the mother's antibodies. These antibodies do not last a long time but can offer some protection for the newborn. This is especially the case with:

TETANUS ANTIBODIES	lasts up to about 6 weeks
MEASLES ANTIBODIES	lasts up to about 6 months

This is why immunizing a pregnant woman is so important to protect the newborn from neonatal tetanus.

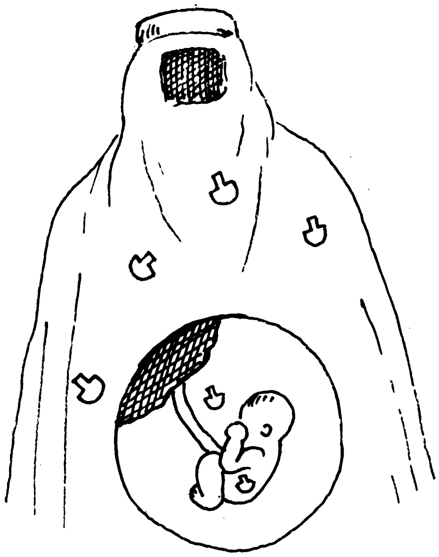


Fig. 5-4. Maternal Immunity
Source: AVICEN

6. POLIO/ORAL POLIO VACCINE (OPV)

6.1. SCOPE OF POLIO PROBLEM

Polio is the biggest cause of lameness. 250,000 cases of lameness are reported world-wide per year. 30,000 children die every year from polio. **ALL OF THESE COULD HAVE BEEN PREVENTED WITH JUST 3 DOSES OF POLIO VACCINE.**

6.2 MICROBE RESPONSIBLE FOR POLIO

Polio is caused by the **POLIO VIRUS** type 1, 2,and 3. It lives in the **STOOLS** of humans infected by polio. Because it is caused by a virus, antibiotics will not kill it.

6.3. TRANSMISSION OF POLIO

In Industrialized countries where sanitation is good, polio can be spread by water droplets when people cough. In countries with poor sanitation, polio is primarily spread from person to person by **STOOLS** in 2 major ways.

1. THROUGH UNWASHED HANDS THAT ARE CONTAMINATED WITH STOOLS
(most common)

Many people are not in the habit of washing their hands with **SOAP** after defecation or before eating. Washing with water alone is not enough to get rid of harmful bacteria and viruses that cause disease. How do unwashed hands transmit polio?

* A child hands become contaminated after defecation. Then he touches the hands of another child. This child puts his hands into his mouth and gets the polio virus into his body.



Fig. 6-1. Contaminated hands after defecation.
Source: HERC

* A mother cleans her child after he defecates. She does not wash her hands with soap. She then feeds her other child with her contaminated hands. In this way the polio virus enters the body.



Fig. 6-2. Mother feeding child with contaminated hands
Source: HERC

2. THROUGH DRINKING WATER CONTAMINATED WITH INFECTED STOOLS
(less common)

This occurs when a latrine is built too close to a well. The stools infected with polio leak through the ground over to the well water. A latrine must be at least **20 METERS** away from a well or water source.

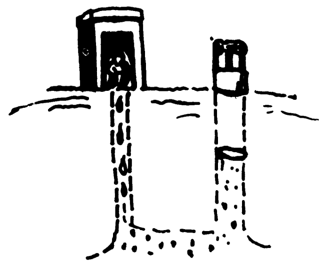


Fig. 6-3. Latrine built too close to well.
Source: HERC

If the latrine is built on higher ground than the well, the infected stool will run down hill and get into the well water. **Never build a latrine on a hill above a well.**

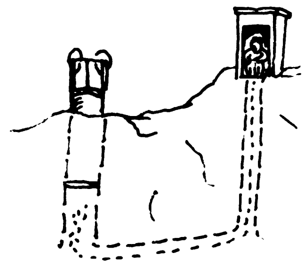


Fig. 6-4. Latrine built uphill from well.
Source: HERC

Water can also become contaminated with stools that have the polio virus in them when a person defecates into a river or lake that is used by others for drinking. (See Figure 6-5.)
NEVER ALLOW ANYONE TO DEFECATE NEAR A WATER SOURCE.



Fig. 6-5. Defecation in water source.
Source: HERC

6.4. PREVENTION OF POLIO

How can we prevent polio?

* By vaccinations
* By protecting the water supply from stool contamination
* By hand washing with **SOAP** every time after defecation
* Polio eradication programs.

6.5. CLINICAL EFFECTS OF POLIO

The polio virus enters the body through the mouth and attaches itself in the throat and gastrointestinal tract.

From here it then enters the tissues of the body and sometimes infects the nerves of the body.

These nerves are first irritated then can be permanently damaged (the part that stimulates the muscles to move).

Usually the nerves of one or two of the legs is affected, less commonly an arm.

In severe cases the nerves that make the breathing muscles work (the chest muscles) stop working and the person cannot breathe on their own. This is the cause of death from polio.

A SEVERE CASE:

Day 1-3: The child is unwell, has a slight fever

Day 3-5: The child complains of headache, stiff neck, nausea and vomiting, muscle pains, and the fever goes up.

Day 5-7: Paralysis on one or both legs. In severe cases the arms are affected or breathing may be paralyzed.[2]

* 95% have no symptoms but pass the virus in their stools.
* 4% get mild flu-like symptoms
* 1% become paralyzed or lame
* 0.5% remain lame for life
* 0.1% will die [2]

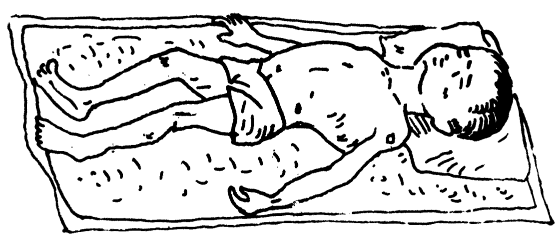


Fig. 6-6. Acute Poliomyelitis
Source: Primary Child Care

Incubation Period: Average of 7-12 days minimum of 3 days and maximum of 21 days.[4]

Period of Communicability: Cases are probably most infectious during the first few days before and after onset of symptoms. (WHO, Polio Eradication Field Guide, 1988).

6.6. ORAL POLIO VACCINE/OPV VACCINE HANDLING

Polio vaccine consists of the **LIVE, WEAKENED, POLIO VIRUSES 1, 2, 3.** It is supplied in either:

Glass vial (dropper to be attached) 20 doses

Polio vaccine is the **MOST SENSITIVE TO HEAT** of all the EPI vaccines. It should be kept frozen before use at the central stores (EPI Office). At peripheral levels (districts) or during transport, should be kept at 0-8 degrees Centigrade.

NEVER USE EXPIRED VACCINES.
ALWAYS CHECK THE EXPIRATION DATE BEFORE USE.

CENTRAL LEVEL STORAGE: -25 C to -15 C
DISTRICT LEVEL STORAGE/VACCINE CARRIER: 0 C to +8 C

ONCE THE VACCINE VIAL HAS BEEN OPENED IT MUST BE USED THE SAME DAY AND ALWAYS KEPT AT 0 to +8C.
DO NOT USE IT AGAIN ON ANOTHER DAY.

6.7. HOW POLIO VACCINE WORKS

The polio vaccine is absorbed by the cells in the mouth, throat, and gastrointestinal tract.

Some of the harmless vaccine virus is defecated out in the stool, which passively immunizes the rest of the community if there is poor sanitation.

Once the vaccine virus is in the body, the body thinks it is the real disease and starts making **POLIO ANTIBODIES.**

Full vaccination with polio (minimum 3 doses) will provide long lasting immunity in 95% of people [3].

6.8. POLIO SCHEDULE

POLIO 0: birth - 15 days
* offers some protection
* helps body respond better to doses 1, 2, 3

POLIO 1:	6 weeks	(1.5 months)
POLIO 2:	10 weeks	(2.5 months)
POLIO 3:	14 weeks	(3.5 months)

ALWAYS WAIT AT LEAST 4 WEEKS (1 MONTH) BETWEEN DOSES. MORE THAN 1 MONTH BETWEEN DOSES IS NOT A PROBLEM.

6.9. POLIO ADMINISTRATION

1. Attach the dropper to the vial (See fig.6-7).
2. Check the label on the vial:
   * To be sure you have the right vaccine
   * To be sure the vaccine is not expired
3. Ask the parent to hold the child firmly on his back.
4. Squeeze the child's cheeks between your fingers to make his lips point forward or pinch his nose so the mouth will open. (See Figure 6-8)
5. Let 2 drops of vaccine fall from the dropper on the child's tongue. Do not allow the dropper to touch the mouth.
6. Make sure the child swallows the vaccine. If he spits it out, give another dose.

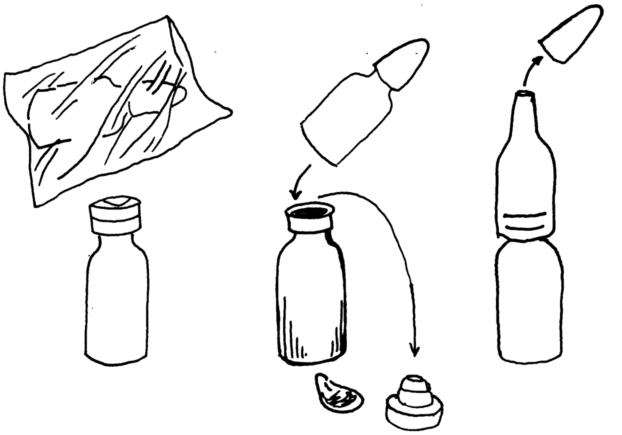


Fig. 6-7. Attaching the dropper to the vial
Source: WHO

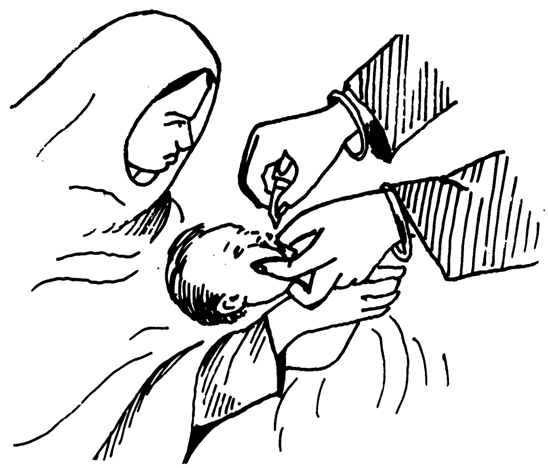


Fig. 6-8. Giving Oral Polio Vaccine. to an infant.
Source: WHO

6.10. SIDE EFFECTS OF POLIO VACCINE

Commonly, there are no side effects from oral polio vaccine. In rare instances, oral polio vaccine is associated with paralysis in vaccine recipients or their contacts. But the incidence is very low; less than one case per one million doses.

6.11. HEALTH EDUCATION FOR FAMILIES ABOUT POLIO

Relatives of the child will better remember what you say if you give health education about polio just as you are giving or have given the vaccine. Here is a guide on what to say using the EPI pictures:

POLIO [give vaccine]

1. This vaccine will protect your child from polio.
2. Do you know what polio is?
3. It causes lameness.[point to lame boy]
4. This vaccine is like a tawiz and will protect your child from becoming lame from polio. [point to vaccinated child and lame boy]
5. It will only work if your child receives 3 doses after the birth polio vaccine. [Point to children on schedule steps receiving polio at 1.5, 2.5, 3.5 months]

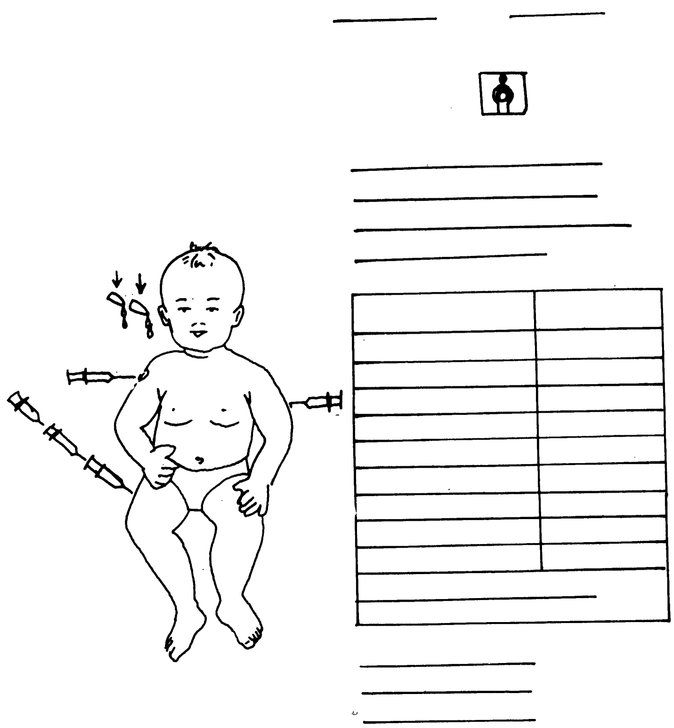


Fig. 6-9. Pictorial EPI Schedule
Adapted from EPI Manual, Philippines by Helen Murphy
Artist: Nancy Jamieson

6. We try to vaccinate children at birth with polio as it helps the other 3 doses work faster. But if we miss your child at birth do not worry as the other 3 will protect your child well. [Point to birth polio]

7. The three doses are usually given when your child is 1.5, 2.5, 3.5 months. (along with DPT vaccines)

8. We must wait one month between doses for the vaccine to work properly.

9. There are no side effects from this vaccine and it will not make your child sick.

10. Your child needs (1, 2, 3) more doses. [Point to unmarked droppers]

11. Keep this card in a safe place and always bring it with you when going to the BHU or to the next vaccination session.

12. We will return on (give date) to give your child (say which ones) vaccines. [Show schedule]

If we miss, you bring your child to the BHU with your card in one month for these vaccines.

13. Questions: Do you have any questions? (answer questions). Check the parent's knowledge.

    * How many more polio vaccines does your child need?

7. TUBERCULOSIS/BCG

7.1. SCOPE OF TB PROBLEM

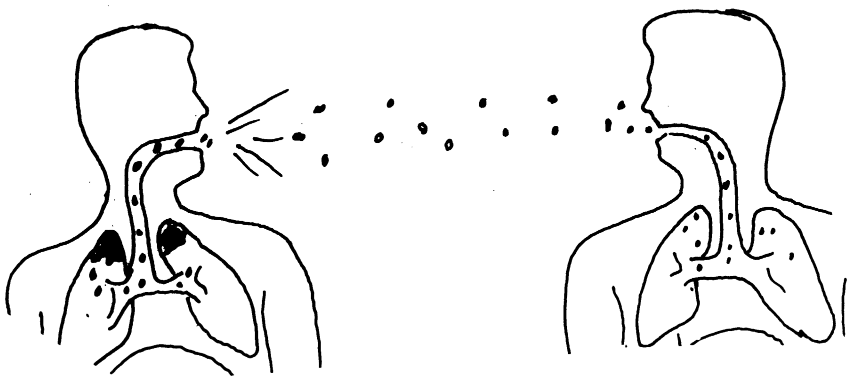
Tuberculosis, or TB, affects almost one half (50%) of the populations living in developing countries like Afghanistan and Pakistan. [1] This means that approximately 50% of people have been infected by the TB microbe and have it in their bodies, although they may not be sick from the disease.

7.2. MICROBE RESPONSIBLE FOR TB

TB is caused by a bacterial microbe called **MYCOBACTERIUM TUBERCULOSIS.** It lives in humans and sometimes in cows, camels, and dromedaries. This microbe outside the body is quickly killed by heat and sunlight. It is not easily killed by antibiotics. To treat TB many antibiotics must be taken over a long period of time. Therefore prevention is much better with immunization being given early in childhood.

7.3. TRANSMISSION OF TB

TB is transmitted by water droplets coming from an infected person when they cough or spit. The TB microbes travel through the air and are breathed in by the next person, landing in their lungs.



Infected person ---> Next person

Fig. 7-1. Spread of TB by cough
Source: H Murphy

Usually a person gets the TB microbe when they are a child from an infected parent or grandparent. When people live close together in crowded conditions, such as in refugee camps, it is easier to be infected with the TB microbe.

7.4. PREVENTION OF TB

There are 5 ways that we can prevent or reduce the number of cases of TB:

1. Always cover mouth when coughing.

2. Avoid spitting. If spitting cannot be avoided, spit in a handkerchief and wash it later, carefully with HOT water. Or spit away from people outside in the sunlight which will kill the microbe. Inside, spit in a spittoon. Each day burn the sputum and clean the spittoon with boiling water to kill the microbes.

3. Keep rooms well ventilated. If there is a lot of ventilation in a room, the TB microbes will be diluted therefore there is less chances inhaling them.

4. Treat all active cases of TB. Any child who is malnourished or anyone with a cough lasting longer than 1 month should be sent to the BHU for TB investigation.

5. Immunize children with BCG as early in life as possible at birth and at least before the child reaches age 1 year.

7.5. CLINICAL EFFECTS OF TB

TB can affect the body in a number of ways:

1. **INACTIVE TB**: The TB microbe is inhaled and reaches the lungs. If the body is strong, it surrounds the microbe with a wall and either the microbe dies or lies dormant. (See Figure 7-2) Calcium spots sometimes can be seem on Xray of these people and they will have a positive skin test (PPD). They can live their lives without becoming sick or become sick later when the body is stressed or weakened. In this case the protective wall breaks open allowing the microbes to spread.

2. **ACTIVE PULMONARY TB**: The TB microbe can infect the lungs, multiply, and destroy the lung tissue. This can occur soon after infection (6 months-1 year) or later during times when the body is weak or under stress such as with:

    * Malnutrition
    * Other diseases
    * Pregnancy
    * Growth spurts (adolescence)
    * Old age

The common symptoms in adults and older children:

* Cough lasting longer than 2 weeks
* Chest pain for 2 weeks or more
* Fever for 2 weeks or more

* Blood in sputum
* Weight loss

Symptoms in children:

* Losing weight or failure to gain weight for 3 months or more. (Common presentation)
* Cough or wheezing for one month or more
* Unexplained fever sometimes with vomiting or headache
* Failure to recover from measles, pertussis or other illnesses [ICD]

3. **EXTRAPULMONARY TB**: TB can spread to all other organs of the body by entering the lymph nodes in the lungs and then the blood system. The TB microbes then settle in different parts of the body, for example:

* Lymph glands of the neck and armpits
* Bones commonly of the spine
* Brain (TB meningitis, commonly in children)
* Intestines
* Kidneys

Incubation Period: It takes from 4-12 weeks from the time of infection to development of a primary lung lesion or a positive skin test (PPD). The risk of developing the active disease is greatest within the first 6 months to 1 year after infection, during adolescence, young adulthood, or in old age.[3][4]

Period of Communicability: As long as there are TB microbes in the sputum, TB can be spread through coughing, sneezing, spitting, or even talking. The communicability depends on the number of microbes coming out, their strength, and the resistance of the other person.[3][4]

7.6. BCG VACCINE/BCG VACCINE HANDLING

BCG vaccine **(Bacille Calmette-Guerin)** consists of the **LIVE WEAKENED, FREEZE-DRIED TUBERCULOSIS BACTERIA.**

It is reconstituted with 2 ml/cc of saline or sterile water, depending on the manufacturer. **NEVER FREEZE THE DILUENT**. Reconstituted BCG will last from 2-4 hours depending on the manufacturer.

ALWAYS CHECK THE MANUFACTURERS INSTRUCTIONS

DO NOT USE OTHER DILUENTS FOR MIXING BCG. USE ONLY THE DILUENT THAT COMES WITH BCG.

BCG is sensitive to HEAT and LIGHT. Always keep you vial of BCG covered with foil, and keep away from light.

PROLONGED EXPOSURE TO LIGHT WILL DESTROY BCG VACCINE

CENTRAL LEVEL STORAGE: O C to +8 C
DISTRICT LEVEL STORAGE/VACCINE CARRIER: O C to +8 C
FREEZING DOES NOT HARM BCG.

ONCE THE VACCINE VIAL HAS BEEN OPENED IT MUST BE USED WITHIN 2-4 HOURS. DO NOT USE IT AGAIN ON ANOTHER DAY.

NEVER USE EXPIRED VACCINES. ALWAYS CHECK THE EXPIRATION DATE BEFORE USE.

7.7. HOW BCG VACCINE WORKS

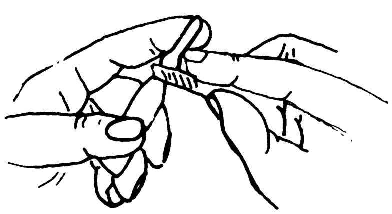
When BCG is injected under the skin and the weakened TB bacteria vaccine is absorbed, the body thinks it is the real disease and starts the immune system to fight TB. This is the most effective in hINFANTS gearly in life as possible. This is why it is recommended hAT BIRTHg. Vaccination with one dose of BCG will be provide 90% immunity against the more dangerous forms of TB in childhood.[ICD]

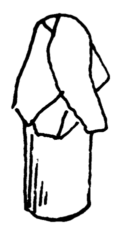
7.8. BCG SCHEDULE

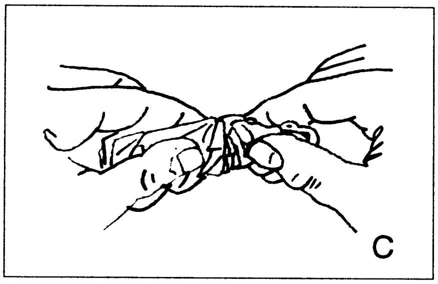
BCG:Immediately after birth, certainly before age one
- * The earlier BCG is given, the better the protection
- * Only 1 dose is required

7.9. BCG ADMINISTRATION

RECONSTITUTION PROCEDURES:
1. Be sure diluent is cold (0-8 C), but not frozen
2. Check to be sure vaccine is not expired
3. Make sure all the vaccine powder is in the bottom of the vial.
4. Cut the ampule neck using metal file (See Fig. 7-3A)
5. Cover ampules with paper when breaking the vials open to protect yourself from cuts. (See Fig. 7-3B)
6. Break open the ampules gently to avoid blowing out the vaccine powder and diluent.
7. Withdraw 2 cc. of diluent using a 5 cc syringe and a long needle.
8. Inject slowly the diluent into the ampule containing the freeze-dried BCG powder.
9. To mix, do not shake, but withdraw the vaccine into the syringe 3 times to be sure the solution is smooth.
10. Wrap the vaccine vial with foil (See Fig.7-3C)
11. Put the vial inside a sterile disposable syringe wrapper (if not a rubber stopper vial) and place in foam hole in vaccine carrier.


A


B



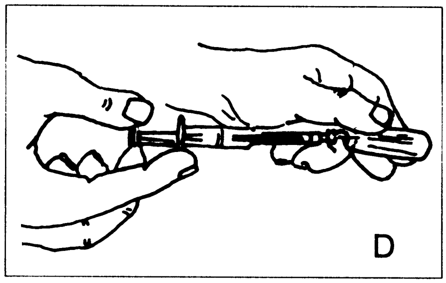


Fig. 7-3 BCG Reconstitution procedure
Source: WHO

GIVING BCG:

1. Check both arms of the child for a BCG scar. If there is ready a scar, **do not** give BCG again.
2. Check the label:
   * To be sure you have the right vaccine
   * To be sure the vaccine is not expired
3. Draw up dose DO NOT PIERCE STERILE NEEDLE THROUGH THE OUTSIDE UNSTERILE SYRINGE WRAPPER WHEN USING BCG AMPULES. **NEVER LEAVE THE NEEDLE IN THE RUBBER STOPPER VIAL.** (See Fig. 7-3D)
4. **BCG DOSE:** (See Fig. 7-4)
   UNDER AGE 1 YEAR: 0.05 cc or 1/20th of a cc.
   OVER AGE 1 YEAR: 0.10 cc or 1/10th of a cc.g
5. Ask the parent to hold the child firmly in the lap with his feet between the parent's legs, arms wrapped around the child's arms and head.
6. Injection site: **RIGHT UPPER ARM.**
7. Wrap your left hand under the child's arm, pulling the skin tight with you thumb and fingers.
8. **DO NOT CLEAN THE SKIN.** This may kill the vaccine as it is injected so superficially.
9. Lay the syringe **FLAT** on the skin **LEVEL UP**. (Fig 7-5)
10. Slip the needle **JUST UNDER THE TOP LAYER OF SKIN.**
    * Be sure the needle is in far enough, otherwise the BCG vaccine will leak out and not be effective.
    * Do not inject too deep. This will cause an abscess and an ugly scar
    * Inject only into the skin **(INTRADERMAL)** (Fig 7-6)
11. Keep the syringe in place by putting your left thumb on the end of the syringe.
12. With your right hand inject the medicine with your right thumb, holding the syringe between your index and third fingers. (See Fig 7-7)
13. It should leave a bump with pits that looks like an orange peel. (See Fig 7-8)

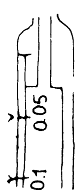


Fig. 7-4 BCG Dose
Source: Reach

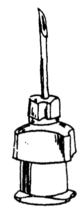


Fig. 7-5 Bevel up
Source: WHO:

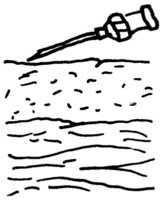


Fig.7-6 BCG
in Dermis
Source: WHO

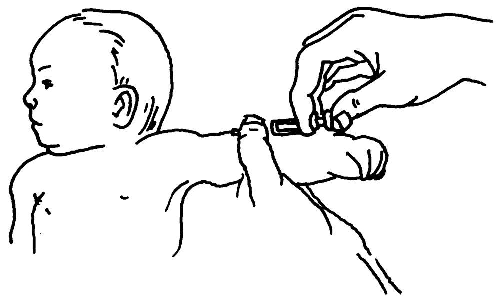


Fig.7-7 Giving BCG
Source: REACH



Fig.7-8 Orange Peel Bump
Source: H. Murphy

7.10. SIDE EFFECTS OF BCG

Normal Reaction:

1. Red bump after 2 weeks.
2. Open draining ulcer after another 2-3 weeks
3. Healing and formation of scar 2-5 months
4. Swollen gland under arm occasionally appears 2-4 months after immunization.

Severe Reaction:
Abscess, deep big ulcer caused by:

1. Using unsterile needle
2. Vaccine contaminated during session
2. Injected too deep/subcutaneously
3. Dose too large

Early Reaction:
If the child has already developed immunity to TB, the red bump will appear earlier than 2 weeks after the injection. This can be due to:

1. Child already had BCG
2. Child has TB

IF YOU NOTICE AN EARLY REACTION TO BCG IN A CHILD WHO HAS NEVER HAD BCG BEFORE, SEND THE CHILD TO THE BHU FOR TB INVESTIGATION

No reaction:
If no BCG Scar appears after 2 weeks, **REPEAT THE DOSE.** This may be due to:

1. the vaccine was not good:
   - Destroyed by light or heat
   - Expired vaccine

2. injection was too superficial with BCG leaking out and not going under the skin

7.11.HEALTH EDUCATION FOR FAMILIES ABOUT TB/BCG

Relatives of the child will better remember what you say if you give health education about TB/BCG just as you are giving or have given the vaccine. Here is a guide on what to say using the EPI pictures:

BCG [give vaccine]

1. This vaccine will protect your child from TB.

2. Do you know what TB is?

3. It is the sickness that is commonly seen in adults and old people. They usually have a cough that does not go away. They do not want to eat and lose weight. They suffer fromfevers and sweats at night. It makes them very weak, skinny, and when it is very bad they cough up blood. If you know of anyone who has a cough longer than one month that doesnot go away, send them to the BHU. [point to skinny man spitting up blood].



Fig. 7-9. TB in Adult Man
Source: SCF-UK

4. BCG vaccine is like a tawiz and will protect your child from this sickness we call TB. [point to vaccinated child and man with TB].

5. It is better to vaccinate for this at birth but we can give it anytime after birth. [point to newborn getting BCG].

6. This vaccine will make a scar. This shows that the vaccine shas done its job. [Point to sores as you speak]

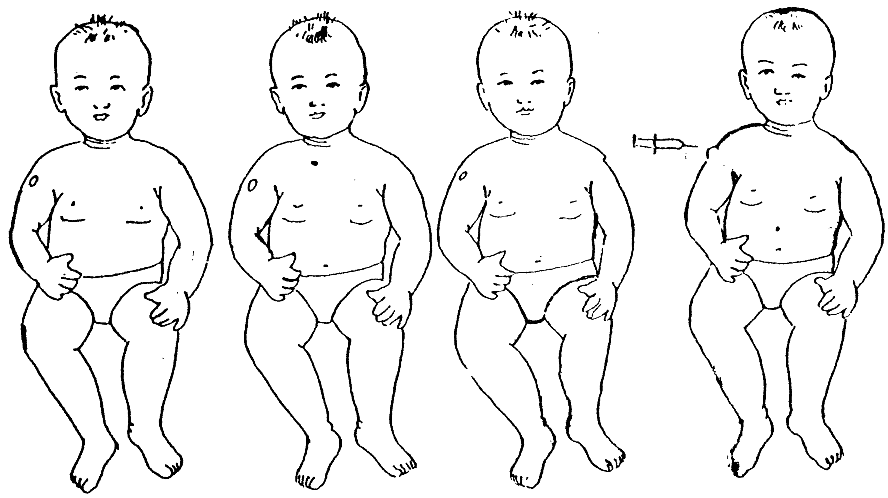


Fig. 7-10 Scarring from BCG
Artist: Mr. Meraj

* After 2 weeks you will notice a red sore
  [point to child with red sore]
* After another 2 weeks the sore will open and drain yellow fluid.
  [point to child with yellow sore dripping]

* DO NOT PUT ANY MEDICINE ON IT, KEEP IT CLEAN AND DRY
* By 3 months it will slowly heal and leave a scar.
  [point to brown scar]
* Rarely lump can develop under the arm
  [point to armpit of child vaccinee]

* If the sore looks big or the lumps concern you bring your child to the BHU and we will check it for you.

* If no sore or scar develops after 2 weeks it means the vaccine did not work and we must give the vaccine again. In that case bring your child to the BHU for a repeat dose.

7. Only one dose is necessary which we have given today. [Mark EPI Picture Card]

8. Keep this card in a safe place and always bring it with you when going to the BHU or to the next vaccination session.
9. We will return on (give date) to give your child (say which vaccines) vaccines. [Show pictorial schedule] See Fig. 7- .

If we miss you, bring your child to the BHU with your card in one month for these vaccines.

10. Questions: Do you have any questions?

* What will happen to the skin here (point to injection site) after receiving this vaccine?

* Will you put anything on it?

8. MEASLES

8.1. SCOPE OF MEASLES PROBLEM

Measles is the **BIGGEST KILLER** of children of all the EPI diseases.

2 million children die from measles each year in the world.

After diarrhea it is the most common cause of **MALNUTRITION.**

Measles is extremely contagious, spreading like a wild fire especially in a crowded refugee camp situation. Almost every child not immunized will get measles if exposed to the disease.

A child is ten times more likely to die of other diseases after having had measles.

The **RISK OF DYING** from measles is increased with:

* Young age
* Chronic diarrhea/dysentery
* Pneumonia
* Malnutrition
* Other infections
* Blindness due to Vitamin A deficiency

8.2. MICROBE RESPONSIBLE FOR MEASLES

Measles is caused by the **MEASLES VIRUS.**

This virus only can live in humans and stays alive by going from person to person.

As it is caused by a virus, antibiotics will not kill it.

8.3. TRANSMISSION OF MEASLES

Measles is transmitted person to person through the air by water droplets coming from the nose and throat of an infected person. It is the most contagious of all the EPI diseases.

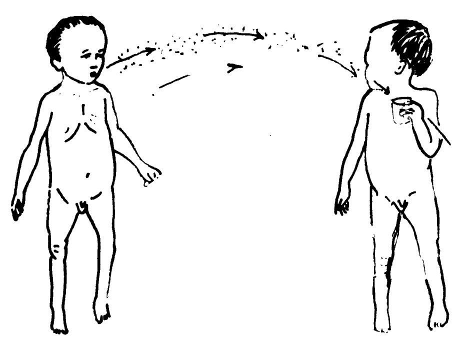


Fig. 8-1. Droplet Transmission
Source: Adapted from Primary

8.4. PREVENTION OF MEASLES

* Vaccination: only reliable method

8.5. CLINICAL EFFECTS OF MEASLES

Day 1-3:
* Common cold, cough, runny nose
* High fever
* Pink watery eyes that are sensitive to light
* White spots on the inside of the cheeks (Koplik spots)

Day 2-4:
* Red,raised rash
* Starting at: ears,then neck,face,body,arms/legs
* Lasting 4 days
* Skin peels off 1 week later [3]

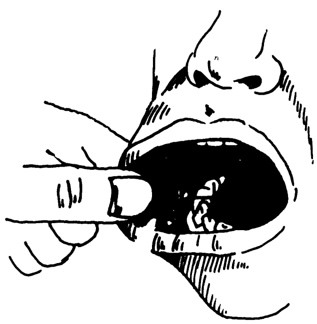


Fig. 8-2: Koplick Spots
Source: Primary Child Car



Fig. 8-3. Measles
Source: REACH

Complications of Measles:

* Pneumonia
* Diarrhea
* malnutrition
* Conjunctivitis (eye infection)-blindness due to Vitamin A deficiency
* Otitis media (ear infection)-deafness
* Encephalitis-brain inflammation



Fig. 8-4. Malnutrition: Common complication of Measles
Source: SCF-UK

Because it is a disease caused by a virus there is no medicine.

One should treat the diarrhea in the usual way, including providing ORS.

If there are secondary bacterial infections one can use antibiotics to treat infections of the lungs,(pneumonia), eyes (conjunctivitis), and ears (otitis media).

Vitamin A should be given to all measles cases to prevent blindness as follows:

Under age 1
or child less than 8 kg.
(1/2 capsule=100,000 IU)
On diagnosis: 1/2 capsule
The next day: 1/2 capsule
1-4 weeks later: 1/2 capsule

Over age 1
or child more than 8 kg
(1 capsule=200,000 IU)
On diagnosis: 1 capsule
The next day: 1 capsule
1-4 weeks later: 1 capsule

Incubation Period: Usually 10 days with a range of 8-13 days from the time of exposure to the onset of fever.[4]

Period of Communicability: A person starts being infectious at about day 1 to day 3, before the onset of fever and cough. This lasts up to the 4 days after the appearance of the rash.[3][4]

8.6. MEASLES VACCINE/MEASLES VACCINE HANDLING

Measles vaccine consists of **WEAKENED, FREEZE-DRIED MEASLES VIRUS.**

The vaccine is reconstituted with 5cc. of sterile water. **NEVER FREEZE THE DILUENT.** Reconstituted measles should be used within one working session if kept at 0 to +8 C. If it is hot summer weather, (Temperature more than + 22C) it should be used within 1 hour. [WHO/EPI]

ALWAYS CHECK THE MANUFACTURERS INSTRUCTIONS

DO NOT USE OTHER DILUENTS FOR MIXING MEASLES. USE ONLY THE DILUENT THAT COMES WITH MEASLES.

Measles vaccine is sensitive to HEAT, the second most sensitive vaccine next to polio.

It is also sensitive to LIGHT. As the measles vials are brown, this protects the vaccine. If the vaccine is left in a syringe for periods of time, light will destroy the vaccine.

CENTRAL LEVEL STORAGE: -25 to -15 C.
DISTRICT LEVEL STORAGE/VACCINE CARRIER: 0 C to +8 C

ONCE THE VACCINE VIAL HAS BEEN OPENED IT MUST BE USED WITHIN 1-8 HOURS AND ONLY IF IT HAS BEEN KEPT AT 0- +8 C. DO NOT USE IT AGAIN ON ANOTHER DAY.

NEVER USE EXPIRED VACCINES.
ALWAYS CHECK THE EXPIRATION DATE BEFORE USE.

8.7. HOW MEASLES VACCINE WORKS

When Measles vaccine is injected into the fat and the vaccine (made from weakened Measles virus) is absorbed, the body thinks it is the real disease and starts making **MEASLES ANTIBODIES.**

One dose of measles vaccine will provide 95% immunity that lasts for life.

DO NOT GIVE MEASLES VACCINE BEFORE AGE 9 MONTHS

Most mothers have had measles and therefore have measles antibodies in their blood. These antibodies are given to the child through the placenta. Measles antibodies can stay in the child's blood for up to 9 months. If the child still has its mother's measles antibodies, it will not make its own antibodies when given.

GIVING MEASLES VACCINE TO A CHILD UNDER 9 MONTHS MAY NOT PROPERLY PROTECT THE CHILD FROM MEASLES FOR LIFE. REPEAT THE DOSE AFTER 9 MONTHS IF THE CHILD HAD IT TOO EARLY.

8.8. MEASLES SCHEDULE

MEASLES: 9 MONTHS

* If there is a measles epidemic and there are cases in children less than 9 months, it can be given at 6 months **BUT** the dose must be **REPEATED AT 9 MONTHS** to be sure the child is properly protected for life.

* Only 1 dose is required
* Always use **ESTIMATED DATE OF BIRTH** to be sure the child is 9 months, not age.
* Remember that the child is not yet age 1 month until 30 days after birth. So that if a child was born in January 1st, he is not 9 months until October 1.

Calendar Month	1	2	3	4	5	6	7	8	9	10	11	12
MONTH	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
AGE mo	birth	1	2	3	4	5	6	7	8	9*		

8.9. MEASLES ADMINISTRATION

RECONSTITUTION PROCEDURE:

1. Be sure diluent is cold (0-8 C)
2. Check to be sure vaccine is not expired
3 Make sure all the vaccine powder is in the bottom of the vial.
4. Cut the ampule neck by using metal file (See Fig 7-3B)
5. Cover ampules with paper when breaking the vials open to protect yourself from cuts.(See Fig. 7-3C)
6. Break open the ampoules gently to avoid blowing out the vaccine powder and diluent.
7. Withdraw 5 cc. of diluent using a 5 cc syringe and a long needle.
8. Inject slowly the diluent into the ampule containing the freeze-dried Measles vaccine powder.
9. To mix, do not shake, but withdraw the vaccine into the syringe 3 times to be sure the solution is smooth.
10. Place in foam hole in vaccine carrier.

GIVING MEASLES VACCINE:

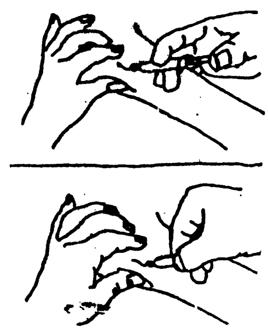


Fig. 8-5
Giving Measles
Source: REACH

1. Check the label:
   * To be sure you have the right vaccine
   * To be sure the vaccine is not expired Vaccine
2. Clean the top of the vial with cotton/spirits
3. Draw up dose (NEVER LEAVE THE NEEDLE IN THE RUBBER STOPPER VIAL)
4. MEASLES DOSE: 0.5 cc (1/2 cc/ml)
5. Ask the parent to hold the child firmly in the lap with his feet between the parent's legs, arms wrapped around the child's arms and head
6. Injection site: **LEFT UPPER ARM.**
7. Clean the skin with cotton/spirits.
8. Pinch the skin of the **OUTER** part of the child's upper arm with your fingers of your left hand. (Fig.8-5)
9 .Push the needle into the pinched up skin not straight but at a 45 degree angle (Fig.8-6).
   * Do not push the needle in too far into the muscle.
   * Inject only into the **FAT (SUBCUTANEOUS)**

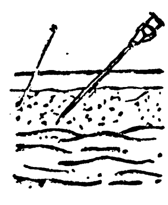


Fig.8-6
Inject Sub-
cutaneously
Source: REACH

10. Pull back the plunger to make sure the needle is not in a blood vessel. If you see blood coming back in the syringe, pull out the needle and syringe. Start over.

INJECTING MEASLES VACCINE INTO A BLOOD VESSEL IS VERY DANGEROUS

11. With your right hand inject the vaccine with your right thumb, holding the syringe between your index and third fingers, and keeping the syringe in place with your 4th and 5th fingers as an anchor.
12. Withdraw the needle while holding the cotton to the injection site to stop the bleeding.

8.10. SIDE EFFECTS OF MEASLES VACCINE

Side effects from measles vaccination occur in a few cases but it is important to warn the families of this possibility so they will not worry.

* fever, rash can occur 1 week after vaccination and last 1-3 days.

8.11. HEALTH EDUCATION FOR FAMILIES ABOUT MEASLES

Relatives of the child will better remember what you say if you give health education about measles just as you are giving or have given the vaccine. Here is a guide on what to say using the EPI pictures:

MEASLES [Give vaccine]

1. This vaccine will protect your child from measles.

2. Do you know what measles is?

3. It is the sickness that gives the child a fever, red spots on skin (rash), and red eyes. [point to red spot and red eyes]



Fig. 8-7. Measles in a Child
Artist: Mr. Meraj

* It spreads very easily among unvaccinated children like a wild fire. It is very dangerous because it is one of the biggest killers of children.

4. This vaccine is like a special tawiz and will protect your child from this sickness, measles. [point to child receiving measles vaccine and child with measles]

5. Only one shot is needed to protect your child from measles. We can only give the vaccine after your child is 9 months.

6. In one week your child may develop a small fever and red spots lasting 3 days, Do not worry. This shows that the vaccine is working.

7. Today your child has received this measles vaccine. [Put an X in syringe at left arm on pictorial EPI card]

8. Keep this card in a safe place and always bring it with you when going to the BHU or to the next vaccination session.

9. We will return on (give date) to give your child (say which vaccines) vaccines.

If we miss you, bring your child to the BHU with this card in one month for these vaccines.

10. Questions: Do you have any questions?

* What is this vaccine for? Test parent's knowledge.

* What may happen in a week after receiving this vaccine?

9. DIPHTHERIA

9.1. SCOPE OF DIPHTHERIA PROBLEM

Diphtheria is not a commonly seen disease but when it occurs, it is often **FATAL.**

There are approximately 5,000 children killed each year from diphtheria in developing countries.

9.2. MICROBE RESPONSIBLE FOR DIPHTHERIA

Diphtheria is caused by the bacteria **CORNYBACTERIUM DIPHTHERIA** which only lives in humans.

Once in the body, this bacteria makes a **TOXIN**, which causes the harmful effects of this disease.

While antibiotics are effective against the bacteria (Penicillin or Erythromycin), they have no effect once the bacteria has produced the toxin. Only diphtheria **ANTITOXIN** can help in this situation and only if given early.

As this antitoxin is not always available, vaccination is the best way to prevent deaths from diphtheria.

9.3. TRANSMISSION OF DIPHTHERIA

Diphtheria is passed from person to person through the air with water droplets discharged from the nose and throat of an infected person.

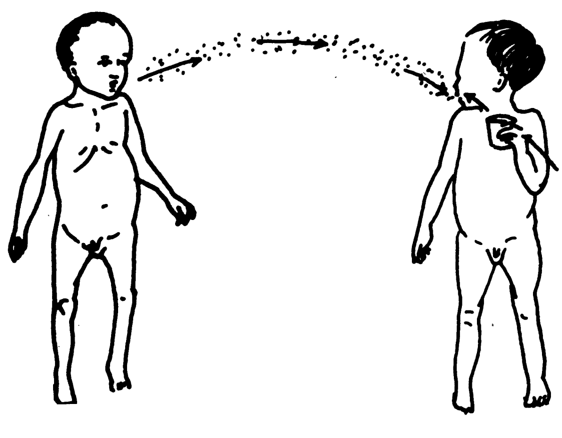


Fig. 9-1. Droplet Transmission
Adapted from Primary Child Care

9.4. PREVENTION OF DIPHTHERIA

* Vaccination with DPT-only effective method
* Isolate active cases for 14 days after beginning of antibiotic treatment.

CHAPTER TOPIC PAGE

9.5. CLINICAL EFFECTS OF DIPHTHERIA

The diphtheria microbes attack the throat, causing a severe infection with swelling of the throat and neck. Once in the body these microbes start producing a poisonous toxin that attacks the nerves of the heart and lung muscles, paralysing them.

Day 1-3:	Mild sore throat, child generally unwell
Day 4-6:	Child feels very ill Grey colored thin tissue covers the throat Neck is swollen Throat may become obstructed
After 2 weeks:	Diphtheria toxin may cause heart failure and paralysis of breathing.[2]



Fig. 9-2. Diphtheria
Source: Primary Child Care

Incubation Period: 2-5 days or longer.

Period of Communicability: 2-3 weeks but shortened if patient on antibiotics.

10. PERTUSSIS

10.1. SCOPE OF PERTUSSIS PROBLEM

Pertussis is a very common disease among children and is especially well known among Afghans.

It is the third biggest killer of all EPI diseases among children, killing 600,000 per year world-wide and affecting millions. It may kill the child under 6 months of age.

It is very contagious. 80% of un-immunized children will get pertussis if exposed to the infection.

10.2. MICROBE RESPONSIBLE FOR PERTUSSIS

Pertussis is caused by a bacteria called **BORDETELLA PERTUSSIS.** It lives only in humans.

Although bacteria is usually killed by antibiotics, they are not very effective with pertussis. Erythromycin or Cotrimoazole will reduce the communicability of pertussis but not the symptoms.

10.3. TRANSMISSION OF PERTUSSIS

Pertussis is passed from person to person through the air with water droplets discharged when the infected person coughs. (See Fig. 10-1)

10.4. PREVENTION OF PERTUSSIS

* Vaccination with DPT

10.5. CLINICAL EFFECTS OF PERTUSSIS

First week: Common cold symptoms: fever, cough, runny nose.

Second week:	Bad cough that does not stop Child struggles to breathe Makes whooping sound Then vomits Cycle repeats: cough-whoop-vomit.
Third week to 3 months:	Cough slowly subsides or may continue for 3 months [2]

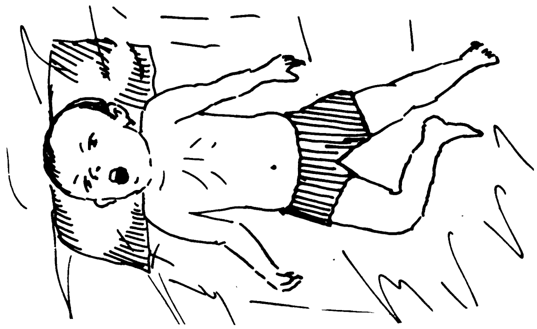


Fig. 10-1 Pertussis
Source: WHO

Incubation Period: Usually 7-10 days. Minimum 5 days, maximum 21 days. [3][4]

Period of Communicability: Highly contagious at onset before the cough lasting up to 3 weeks. Antibiotics can shorten this to 5-7 days after starting therapy. [3][4]

11. ADULT TETANUS

11.1. SCOPE OF TETANUS PROBLEM

Tetanus occurring in anyone older than one month is called adult tetanus. It is not as common as neonatal tetanus but is frequently FATAL.

11.2. MICROBE RESPONSIBLE FOR TETANUS

Tetanus is caused by a bacteria called **CLOSTRIDIUM TETANI.** The tetanus microbe is covered by a strong wall or spore and lives outside the body in the **SOIL** and **STOOLS** of animals, particularly in horses.

Once in the body, this bacteria produces a dangerous poison called a **TOXIN**, which causes the harmful effects of this disease.

Penicillin can the tetanus bacterial but once the microbe is in the body and makes the toxin, penicillin has no effect on this dangerous toxin. Only an antitoxin **Anti-Tetanus Serum (ATS)** can reverse the effects of the toxin and only if given early.

11.3. TRANSMISSION OF TETANUS

In age groups older than 1 month, tetanus is transmitted through dirty wounds.

The tetanus microbe gets into the body when the skin is punctured by an object contaminated with soil or stools containing the tetanus spore or microbe.



Fig. 11-1. Tetanus from stepping on a dirty nail
Source: HERC

11.4. PREVENTION OF TETANUS

* Vaccination with DPT
* Thorough cleaning with SOAP of all wounds
* ATS injection if unvaccinated

11.5. CLINICAL EFFECTS OF TETANUS

After the tetanus microbes enter the body through a puncture or dirty wound, they produce tetanus toxin. This poison attacks the nervous system, making the nerves very irritable. These nerves over stimulate the

muscles making them stay tight and contracted. This is why the jaw locks closed and the body becomes rigid.

* Painful contractions and spasms of muscles
  - -first of mouth and neck muscles
  - -then trunk, arms, and legs

* Cannot open mouth to eat/breathing muscles not work

* Death from seizures/unable to breathe



Fig. 11-2. Tetanus in an older child
Source: Primary Child Health

Incubation Period: Usually 6 days, range 3-21 days. Most cases occur within 14 days. [3][4]

Period of Communicabilit: None. Tetanus is not transmitted from person to person.

12. DPT VACCINE

12.1. DPT VACCINE/DPT VACCINE HANDLING

DPT vaccine is a combination of three vaccines:

"D" Diphtheria antitoxin- This consists of **WEAKENED DIPHTHERIA TOXIN.** It is **DESTROYED BY FREEZING.**

"P" Pertussis vaccine - This consists of **DEAD PERTUSSIS BACTERIA.** It is destroyed by heat.

"T" Tetanus antitoxin - This consists of **WEAKENED TETANUS TOXIN.** It is **DESTROYED BY FREEZING.**

DPT is destroyed by FREEZING and HEAT.

If you suspect that a vial of DPT has been frozen do the **SHAKE TEST.** See chapter on COLD CHAIN for instructions.

CENTRAL LEVEL STORAGE: 0 C to +8 C
DISTRICT LEVEL STORAGE/VACCINE CARRIER: 0 C to +8 C

ONCE THE VACCINE VIAL HAS BEEN OPENED IT MUST BE USED THE SAME DAY AND ONLY IF IT HAS BEEN KEPT AT 0- +8 C. DO NOT USE IT AGAIN ON ANOTHER DAY.

NEVER USE EXPIRED VACCINES.
ALWAYS CHECK THE EXPIRATION DATE BEFORE USE.

12.2. HOW DPT VACCINE WORKS

When DPT vaccine is injected into the muscle and the weakened diphtheria and tetanus toxin and dead pertussis bacteria is absorbed, the body thinks it is the real diseases and starts making DIPHTHERIA, PERTUSSIS, AND TETANUS ANTIBODIES.

12.3. DPT SCHEDULE

DPT 1:	6 weeks	(1.5 months)
DPT 2:	10 weeks	(2.5 months)
DPT 3:	14 weeks	(3.5 months)

DPT IS SAFE TO GIVE CHILDREN UNDER AGE 5

* Because Pertussis is commonly fatal in young children it is important to give DPT right at 6 weeks for early protection.

* DPT should not be given before 6 weeks of age and the 3 dose should be completed before the child reaches 6 months.

ALWAYS WAIT AT LEAST 4 WEEKS (1 MONTH) BETWEEN DOSES. MORE THAN 1 MONTH BETWEEN DOSES IS NOT A PROBLEM.

12.4. DPT ADMINISTRATION

1. Check the label:
   * To be sure you have the right vaccine
   * To be sure the vaccine is not expired
2. Shake the DPT vial
3. Clean the top of the vial with cotton/spirits
4. Draw up dose **(NEVER LEAVE THE NEEDLE IN THE RUBBER STOPPER VIAL)**
5. **DPT** DOSE: .5 cc (1/2 cc/ml)
6. Ask the parent to hold the child firmly in the lap with his feet between the parent's legs, arms wrapped around the child's arms and head.
7. Injection site: **UPPER OUTER THIGH**

* It is dangerous to give DPT to a child in the buttocks because it is too easy to hit the sciatic nerve by mistake. This nerve runs down the middle of the buttock. If the needle hits this nerve, it can cause damage to the nerve resulting in a weakened/paralysed leg.

NEVER INJECT DPT INTO THE BUTTOCK OF A YOUNG CHILD ALWAYS INJECT INTO THE UPPER OUTER THIGH

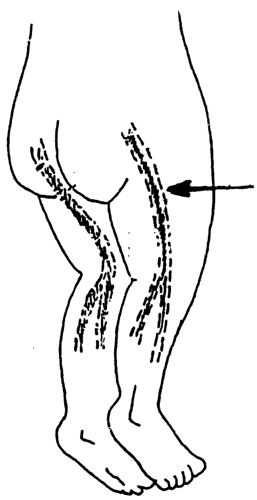


Fig. 12-1. Sciatic nerve
Source: WHO

8. Clean the skin with cotton/spirits.
9. Put your finger and thumb on each side of the injection place. Stretch the skin flat between your finger and sthumb.

10. Quickly push the needle into skin straight at a 90 degree angle
* Do not push the needle in too far if the child is very thin or you
will hit the bone causing much pain.
* Inject only into the **MUSCLE (INTRAMUSCULAR)**
11. Pull back the plunger to make sure the needle in not in a blood vessel. If you see blood coming back in the syringe, pull out the needle and syringe and start over again.

INJECTING DPT VACCINE INTO A BLOOD VESSEL IS VERY DANGEROUS

12. With your right hand inject the vaccine with your right thumb, holding the syringe between your index and third fingers, and keeping the syringe in place with your 4th and 5th fingers as an anchor.
13. Withdraw the needle while holding your cotton to the injection site to stop the bleeding.

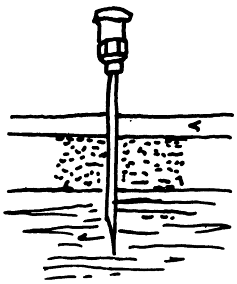


Fig. 12-2 DPT in the Muscle
Source: REACH



Fig. 12-3. Injecting DPT
Source: WHO

12.5. SIDE EFFECTS FROM DPT VACCINE

The side effects from DPT are:

1. Tenderness, swelling and redness for 1 day at injection site.
2. Fever and irritability of child for 1 night

Applying local heat or balms to the injection site will help the symptoms and not interfere with the vaccine. If the pain, redness and swelling continues longer than 1 day or becomes worse this is an ABSCESS and the child should be seen at the BHU.

CAUSES OF ABSCESS (abscess picture)

*contaminated needle or syringe
-syringe/needle was used more than once
-syringe/needle not properly sterilized
*contaminated vaccine vial
-vaccinator left needle in vial for multiple doses
*dirty skin
-vaccinator forgot to clean skin before injecting

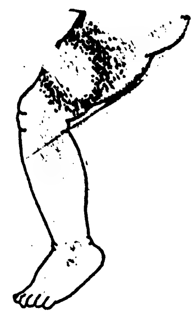


Fig. 12-4 Injection Abscess
Source: WHO

Pertussis parts of the vaccine causes:

-fever (38-39 C)
-irritability

The family should keep the child cool with cool baths and give Paracetamol if they have it.

Rarely a child can have seizures (1 case per 25,000 injections) or permanent brain damage (1 case per 300,000 injections). But the chances of pertussis and the complications such as seizures in unvaccinated children is **MUCH HIGHER.**

IF THE FAMILY TELL YOU THAT THE CHILD HAD A SEIZURE AFTER THE LAST DPT VACCINATION, GIVE DT INSTEAD.

12.6. HEALTH EDUCATION FOR FAMILIES ABOUT DPT VACCINE

Relatives of the child will better remember what you say if you give health education about DPT just as you are giving or have given the vaccine. Here is a guide on what to say using the EPI pictures:

DPT [Give vaccine]

1. This vaccine will protect your child from 3 diseases.

2. The first disease is called DIPHTHERIA. This sickness is rare but is frequently fatal.

* It causes a very bad infection of the throat, making it look like it is covered by a grey thin piece of paper.
* Then the neck swells like a balloon
[point to the throat and neck in the diphtheria picture]



Fig. 12-5. Diphtheria
Artist: N. Jamieson

* It kills children by stopping their throat from working so they cannot breathe or eat.

3. The second disease is PERTUSSIS. Do you know this disease?

* It is the sickness that makes the cough so bad that they make a whopping sound and then vomit.[Point to the child coughing in the pertussis picture]



Fig. 12-6. Pertussis
Artist: N. Jamieson

* It often causes the child to be thin as they vomit so much

* If the child is under 6 months of age, it can easily kill the child as they choke and stop breathing.

4. The third disease is called TETANUS, which is the illness you know as being caused by "peeryan or "bod" that kills newborns.

* Your child can get this illness from stepping on a dirty nail or having a dirty wound.

1. POLICIES

1.1. THE IMPORTANCE OF EPI IN AFGHAN REFUGEE HEALTH

The six EPI target diseases are usually a bigger problem for refugees than for people living in their own country.

* These diseases spread easily due to crowded living conditions.

* People who are malnourished have decreased resistance to infections.

Therefore it is important to PREVENT the diseases from occuring in refugees by immunizing them.

It is important to do this NOW before the Afghan people return home because:

* They are together and easier to reach
* It is more difficult to do inside of Afghanistan because:
  - transportation has been destroyed by the war
  - communications are difficult
  - cold chain is harder to maintain
  - there are less vaccinators
  - it is difficult to supervise an EPI program

EPI Diseases kill and disable 3.5 million children a year in developing countries [1].

* MEASLES kills over 2 million children a year

* NEONATAL tetanus kills 800,000 babies a year

* PERTUSSIS kills 600,000 children a year

* POLIO is the biggest cause of lameness affecting 30,000 a year.

* TUBERCULOSIS affects 10 million people a year

* DIPHTHERIA is rare but kills 15% of its victims.

ALL OF THESE DISEASES ARE PREVENTIBLE WITH VACCINES

* Throughout the world there is a goal to immunize at least 80% of all children under age 1 by 1990 plus to eradicate polio by the year 2000 and eliminate neonatal tetanus. Although many countries did not reach 80% coverage by 1990 this level of coverage remains the goal for all countries.

* Tetanus causes all the muscles to tighten . The body becomes stiff like a board then the person or child dies because they stop breathing. [point out stiff body in the tetanus picture]



Fig. 12-7. Tetanus in an older child
Artist: N. Jamieson

5. This vaccine is like a tawiz and will protect your child from all 3 of these diseases.

6. After receiving this vaccine there may be some soreness and a lump where I injected. Tonight your child may have a fever. Do not worry, this is because the vaccine is working. Keep your child cool by giving a cool bath.

7. We give this vaccine with the polio drops usually at 1.2, 2.5, 3.5 months, waiting 1 month between shots. [Point to children and moons on pictorial EPI schedule]

8. Your child will only be protected if we give 3 doses. [point to three injections on pictorial EPI card]

9. Today your child has received its (1st/2nd/3rd) dose. [Put an X in the picture of syringe]

10. Your child needs (1, 2, 3) more doses. [Point to unmarked syringes]

11. Keep this card in a safe place and always bring it with you when going to the BHU or to the next vaccination session.

12. We will return on (give dates) to give your child (say which vaccines) vaccines. [Show pictorial schedule]

If we miss you, bring your child to the BHU with your card in one month for these vaccines.

13. Questions: Do you have any questions?

* How many diseases does this vaccine protect your child from?

* How many more doses are needed?

13. NEONATAL/MATERNAL TETANUS/TT VACCINE

13.1. SCOPE OF NEONATAL TETANUS PROBLEM

Neonatal tetanus is the biggest killer of children under 1 month of age.

Of all infants who die after delivery, 50% are caused by neonatal tetanus.

Tetanus kills at least 800,000 newborns every year in the world. The real number is probably much higher as this disease is rarely reported.

13.2. MICROBE RESPONSIBLE FOR NEONATAL TETANUS

Tetanus in newborns and mothers is caused by a same bacteria called **CLOSTRIDIUM TETANI** that causes tetanus in adults and older children. The tetanus microbe is covered by a strong wall or spore and lives outside the body in the **SOIL** and **STOOLS** of animals, particularly in horses.

Once in the body, this bacteria produces a dangerous poison called a **TOXIN**, which causes the harmful effects of this disease.

As the microbe is a bacteria, penicillin will kill it, but pencillin has no effect on this dangerous toxin. Only an antitoxin **ATS** can reverse the effects of the toxin and only if given early.

13.3. TRANSMISSION OF NEONATAL TETANUS

IN NEWBORNS

* Cutting umbilical cord with unsterile knife or razor.

    If the knife or razor used to cut the newborn's cord is not sterile, it may have tetanus bacteria on it. This bacteria gets into the baby's body through the cord blood.

* Touching the cord with unclean hands.

    If the birth attendant does not wash her hands with soap teta--nus bacteria may remain on her hands. Then when she handles the cut cord, the bacteria enter the body.

* Delivering the baby directly onto the dirty floor or on a dirty cloth

* The baby's cord may come in contact with the dirt or unclean cloth containing tetanus bacteria.

* Tying the cord with an unsterile thread
    The thread if not boiled may also have tetanus bacteria on it

which will get into the cord and then blood of the baby.

* Covering umbilical cord with unsterile things like:
  - -kohl
  - -henna
  - -cow dung
  - -dirty cloth

Sometimes the mother or dai put traditional ointments on the cord to help it heal or cloth that has not been sterilized. All of these things may have tetanus bacteria in them. Then this bacteria enters the baby's blood stream through the cord.

IN MOTHERS

* Unclean hands of the birth attendant/unclean rags

Sometimes the dai or relative helping the mother deliver must reach inside of the woman to help bring out the child or stop the bleeding. If her hands were not washed with soap or if she is wearing rings and bangles, these things may have dirt on them contaminated with tetanus bacteria. Cloth used to stop bleeding may also have tetanus bacteria on it. In this way the bacteria enter the woman's womb and enter into her blood.

* Birth attendant puts dirty feet near birth canal of woman to help woman push out baby.

In this case the feet may have tetanus bacteria on them and enter into the womans' womb and blood.

13.4. PREVENTION OF NEONATAL/MATERNAL TETANUS

* 2 INJECTIONS OF TETANUS TOXIDE (TT) ONE MONTH APART AT LEAST 2 WEEKS BEFORE DELIVERY.

* STERILE DELIVERY PRACTICES

FOR THE NEWBORN

* ALWAYS CUT THE CORD WITH A STERILE RAZOR OR KNIFE
  - Boil the razor or knife in water for 20 minutes
  - Heat knife in a flame until it glows red

CLEANING A KNIFE OR RAZOR WITH SPIRITS WILL NOT KILL TETANUS BACTERIA

*** USE STERILE THREAD (BOILED IN WATER FOR 20 MINUTES) TO TIE CORD**

*** COVER THE CORD WITH STERILE CLOTH (BOILED IN WATER FOR 20 MINUTES) AND KEEP DRY AND CLEAN. DO NOT PUT ANYTHING ELSE ON THE CORD.**

*** DELIVER BABY ON A STERILE CLOTH (BOILED FOR 20 MINUTES IN WATER)**



Fig. 13-1 The 4 CLEANS for Cord Care

1. Clean Hands
2. Clean blade and thread for cutting the cord
3. Clean surfaces
4. Put only clean things on the cord

Source: SCF-UK

FOR THE MOTHER

*** BIRTH ATTENDANT SHOULD REMOVE ALL RINGS AND BANGLES.**

*** BIRTH ATTENDANT SHOULD SCRUB WITH SOAP VIGOROUSLY FOR 5 MINUTES EACH HER: HANDS, NAILS, ARMS, AND FEET BEFORE DELIVERY.**

*** BIRTH ATTENDANT SHOULD USE ONLY STERILE CLOTH (BOILED IN WATER FOR 20 MINUTES) DURING DELIVERY**

13.5. CLINICAL EFFECTS OF NEONATAL TETANUS

After the tetanus microbes enter the body through the cord of the newborn or through the womb in the mother, they produce tetanus toxin.

This poison attacks the nervous system, making the nerves very irritable. These nerves over stimulate the muscles making them stay tight and contracted. This is why jaw locks closed and the body becomes rigid. The features of tetanus are:

* Painful contractions and spasms of muscles
  -first of mouth and neck muscles
  -then trunk, arms, and legs
* Cannot open mouth to eat/breathing muscles not work
* Death from seizures/unable to breathe

TETANUS IN NEWBORN:

* appears healthy at birth/sucks at breast normally
* after a few days stops sucking
* develops tight mouth (looks like a smile)
* develops rigid body spasms/seizures
* dies between 3rd and 28th day (most usually before the 14th day) [2]



Fig. 13-2. A baby with neonatal tetanus
Source: WHO

13.6. TT VACCINE/TT VACCINE HANDLING

"TT" is **TETANUS TOXOID.** It consists of **WEAKENED TETANUS TOXIN.**

TT is destroyed by FREEZING and HEAT.

If you suspect that a vial of TT has been frozen do the **SHAKE TEST.** See chapter on COLD CHAIN for instructions. (pp. 96)

CENTRAL LEVEL STORAGE: 0 C to +8 C
DISTRICT LEVEL/VACCINE CARRIER: 0 C to +8 C

ONCE THE VACCINE VIAL HAS BEEN OPENED IT MUST BE USED THE SAME DAY AND ONLY IF IT HAS BEEN KEPT AT 0- +8 C. DO NOT USE IT AGAIN ON ANOTHER DAY.

NEVER USE EXPIRED VACCINES.
ALWAYS CHECK THE EXPIRATION DATE BEFORE USE.

13.7. HOW TT VACCINE WORKS

When TT vaccine is injected into the muscle and the weakened tetanus toxin is absorbed, the body thinks it is the real diseases and starts making **TETANUS ANTIBODIES.**

A minimum of two doses of TT vaccine given **at least 2 weeks before delivery** one month apart is required to give full protection against tetanus in the mother and newborn.

DOSES TT	YEARS OF PROTECTION
2 doses TT	3 years
3 doses TT	5 years
4 doses TT	10 years
5 doses TT	Life

13.8. TT SCHEDULE

FOR PREGNANT WOMEN AND WOMEN 15-45 YEARS

TT 1	first visit
TT 2	1 month later
TT 3	6 months after TT2 (or next pregnancy)
TT 4	1 year after TT3 (or next pregnancy)
TT 5	1 year after TT4 (or next pregnancy)

13.9. TT ADMINISTRATION

1. Check the label:
   * To be sure you have the right vaccine
   * To be sure the vaccine is not expired
2. Shake the TT vial
3. Clean the top of the vial with cotton/spirits
4. Draw up dose **(NEVER LEAVE THE NEEDLE IN THE RUBBER STOP PER VIAL).**
5. TT DOSE: 0.5 cc (1/2 cc/ml)
6. Injection site: **UPPER OUTER SIDE OF LEFT ARM**
7. Clean the skin with cotton/spirits.
8. Put your finger and thumb on each side of the injection place Stretch the skin flat between your finger and thumb.
9. Quickly push the needle into skin straight at a 90 degree angle

* Do not push the needle in too far if the woman is very thin or you will hit the bone causing much pain.
* Inject only into the **MUSCLE (INTRAMUSCULAR)**

10. Pull back the plunger to make sure the needle in not in a blood vessel. If you see blood coming back in the syringe, pull out the needle and syringe and start over again.

INJECTING TT VACCINE INTO A BLOOD VESSEL IS VERY DANGEROUS

11. With your right hand inject the vaccine with your right thumb, holding the syringe between your index and third fingers, and keeping the syringe in place with your 4th and 5th fingers as an anchor.

12. Withdraw the needle while holding your cotton to the injection site to stop the bleeding.



Fig. 13-3 Giving TT to a woman
Source: WHO

13.10. SIDE EFFECTS FROM TT VACCINE

The side effects from TT are:

At injection site
- -Pain
- -Slight redness
- -Swelling (a hard bump)

This will last only 1 day.

Applying local heat or balms to the injection site for comfort will help the symptoms and not interfere with the vaccine.

If the pain, redness and swelling continues longer than 1 day or becomes worse this is an **ABSCESS** and the woman should be seen at the BHU.

CAUSES OF ABSCESS

*contaminated needle or syringe
-syringe/needle was used more than once
-syringe/needle not properly sterilized

*contaminated vaccine vial
-vaccinator left needle in vial for multiple doses

*dirty skin
-vaccinator forgot to clean skin before injecting

13.11.HEALTH EDUCATION FOR WOMEN ABOUT TT VACCINE

A woman will better remember what you say if you give health education about TT just as you are giving or have given the vaccine. Here is a guide on what to say using the EPI pictures:

TT [give vaccine]

1. This vaccine will protect you and your newborn child from tetanus. Do you know what tetanus is?

2. This is the illness you know as being caused by "peeryan or "bod" that kills newborns. It makes all the muscles in your newborn child tight, then the child becomes stiff like a board and dies from stopping breathing. This disease can affect mo -thers too. [point to stiff newborn and mother]

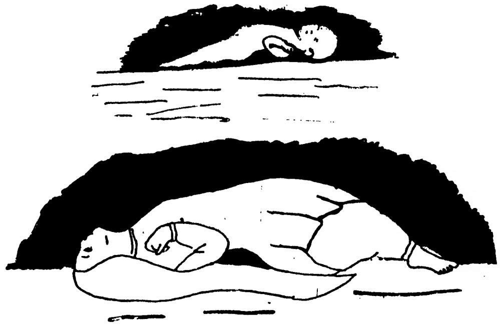


Fig. 13-4. Tetanus in Newborn and Mother
Artist: N. Jamieson

* Your newborn can get it when its cord is cut with a dirty knife or when dung from animals or dirt gets on the end of the cord Al-ways boil the knife for 20 minutes before cutting the cord and keep the cord clean.

* You can get this disease also if the woman who helps you deliver does not wash her hands with SOAP to take away the unseen dirt on her hands. [point to soap]



Fig. 13-5. The birth attendant must wash her hands with SOAP
Source: Baluchistan Development Resouce Center

3. This vaccine is like a tawiz that will protect you and your newborn child from this "peeryan" or "bod" disease we call tetanus.

   * IT WILL NOT CAUSE ABORTIONS OR MAKE YOU STERILE.

4. You need at least 2 injections during pregnancy then:

   One 6 months after TT2
   (or with next pregnancy)
   One a year after TT3
   (or with next pregnancy)
   One a year after TT4
   (or with next pregnancy)

   * A total of 5 will give life protection

   [Show 5 injections]

5. Today you have received your (1st/2nd/3rd/4th/5th) dose. [Put an X in the picture of syringe]

6. You still need (1, 2, 3, 4) more doses. [Point to unmarked syringes]

7. Keep this card in a safe place and always bring it with you when going to the BHU or to the next vaccination session.

8. We will return on (give date) to give you your (2nd, 3rd, 4th, last) dose. [Show card]

If we miss you, come to the BHU with your card in (1month/ 6 months/1 year/when you get pregnant) for this vaccine.

9. Questions: Do you have any questions?
   * How many more shots do you need?
   * When do you need another shot?

1.2. TARGET POPULATION

There are 2 target populations that must be fully immunized:

1) CHILDREN UNDER 1 YEAR: Children must be immunized as early as possible before the child is exposed to the target diseases. 3.7% of the population are children under 1 year. To calculate the target population of children under age 1:

   TOTAL POPULATION x .037 = Number of children under 1

2) WOMEN OF CHILD BEARING AGE (aged 15-45) with a PRIORITY FOR PREGNANT WOMEN. This is because of the very high rates of neonatal tetanus. 50 percent of all deaths of newborns is from neonatal tetanus. This is prevented by simple vaccination of women with Tetanus Toxoid.

   22% of the population are women 15-45. To calculate the target population of child bearing women:

   TOTAL POPULATION x .22 = Number of women 15-45

1.3. EPI SCHEDULE

CHILDREN UNDER AGE 1

VACCINE	MINIMUM AGE FOR IMMUNIZATION	INTERVAL
POLIO 0	BIRTH	
BCG	BIRTH or before age 1	
POLIO 1/DPT 1	6 WEEKS (1.5 MONTHS)	
POLIO 2/DPT 2	10 WEEKS (2.5 MONTHS)	1 MONTH BETWEEN
POLIO 3/DPT 3	14 WEEKS (3.5 MONTHS)	DOSES
MEASLES	9 MONTHS	

WOMEN AGE 15-45

VACCINE	TIME	PROTECTION
TT 1	FIRST CONTACT	
TT 2	AFTER 1 MONTH	3 yrs
TT 3	AFTER 6 MONTHS (OR NEXT PREGNANCY)	5 yrs
TT 4	AFTER 1 YEAR (OR NEXT PREGNANCY)	10 yrs
TT 5	AFTER 1 YEAR (OR NEXT PREGNANCY)	lifetime

14. COLD CHAIN

14.1. IMPORTANCE OF COLD CHAIN

COLD CHAIN refers to the system that keeps all the EPI vaccines at a specific cool temperature range to keep them **POTENT.**

If this system is not maintained, the EPI Programme will fail and be worthless as the vaccines will not work properly.

Vaccines are very **FRAGILE** and must be **PROTECTED.** All the EPI vaccines are **DESTROYED BY HEAT,** some by **FREEZING,** and some by **LIGHT.**

DESTROYED BY HEAT (ALL EPI VACCINES)	DESTROYED FREEZING	DESTROYED BY LIGHT
1. POLIO	1.DPT	1. BCG
2. MEASLES	2.TT	2. MEASLES* (* when supplied in clear vials)
3. DPT	3.DT	
4. BCG		
5. TT/DT		

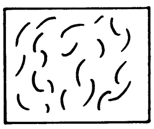


Fig. 14-1 Heat
Source:HERC

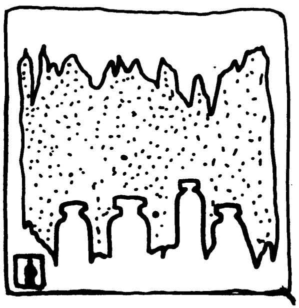


Fig. 14-2 Freezing
Source: WHO

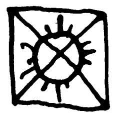


Fig. 14-3 Light
ource: HERC

Vaccines are like ice cream. Heat spoils vaccines. They are no longer in the same state or any good if exposed to heat.

Once exposed to heat, cooling the vaccine down again will not restore it to its pervious potency. It is irreversibly changed. It is like when you fry an egg. Once heated a little, the egg white changes to a white color. Cooling it down will not make it raw or clear again. [2]

It is the same with vaccines when exposed to heat, light (BCG, Measles), or frozen (DPT, DT, TT). These things change the composition of the vaccines so that they are ruined and will no longer be active in the body when injected.

The damage done by heat is CUMULATIVE over time. A lot of heat at once (ie: in a closed vehicle in the hot summer sun) or exposure to heat many times (opening the refrigerator door frequently) can ruin the vaccine just the same.[2]

14.2. THE COLD CHAIN LINKS

These fragile vaccines must be maintained at a special temperature range from the time they leave the **MANUFACTURER** to time they are injected into **THE WOMAN AND CHILD.**

There are different stations or rest houses along the route from manufacturer to mother and child where the vaccines are stored until they can be sent to the next station. In each place there must be PEOPLE and EQUIPMENT to keep the vaccines at the necessary temperature. Stations: **MANUFACTURER** (cold room)

ISLAMABAD (cold room), EPI PROVINCIAL OFFICE (freezers/frig), FSMO OFFICE (frig), BHU (frig), WOMAN AND CHILD.

Each time they are moved to the next station closer to the woman and child, this temperature must be maintained during transportation. These are the vital links of the chain.

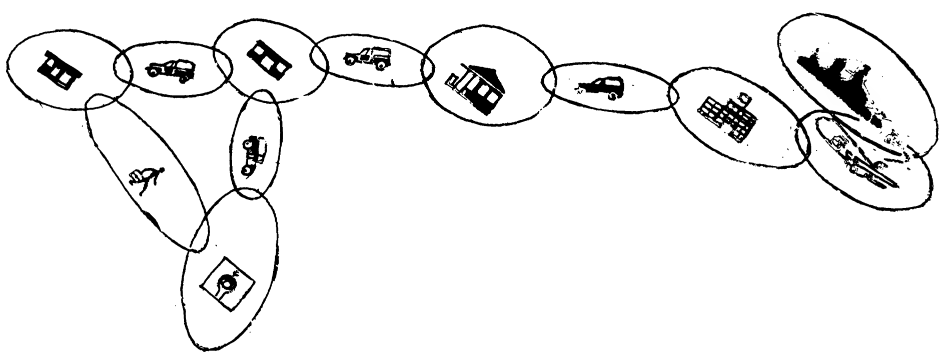


Fig. 14-4. The Cold Chain Adapted from WHO: Managing the Cold Chain

WAYS THE COLD CHAIN LINK CAN BE BROKEN

If anyone along the journey from manufacturer to mother and child does not keep the vaccines cold and protected from freezing (DPT,DT,TT) or light (BCG,Measles) the vaccines will be ruined. The link of the chain from manufacturer to woman and child is therefore BROKEN. Examples of breaking the chain:

* Sitting at the airport as customs takes too long.
* Power failures at cold stores
* Vaccines lost in transit a few days
* Vaccinator leaving carrier in the sun

14.3. VACCINE STORAGE TEMPERATURES AND STABILITY

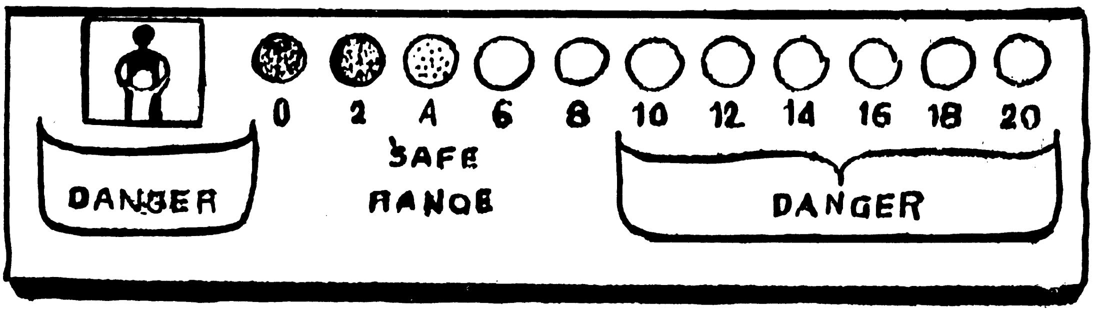


Fig. 14-5. RECOMMENDED TEMPERATURES AND STORAGE TIME
Source: WHO: Managing the Cold Chain

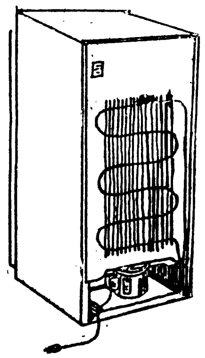
- * **NEVER FREEZE DPT, DT, TT**
- ** STORAGE TIMES ARE ONLY MAXIMUM RECOMMENDED
- *** ALWAYS CHECK EXPIRATION DATES. NEVER USE EXPIRED VACCINES

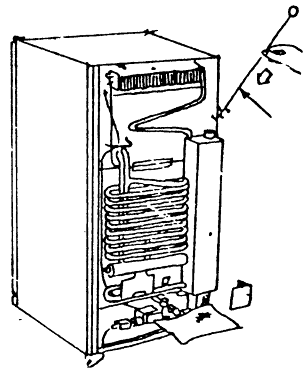
* NEVER USE ANY VACCINE WHEN THERE IS A DOUBT THAT IT HAS BEEN KEPT AT A TEMPERATURE BETWEEN 0 C TO + 8 C

14.4. COLD CHAIN STORAGE EQUIPMENT

A. COLD ROOMS: A cold room is a walk-in refrigerator or freezer that can store large amounts of vaccines in boxes or crates. This is where our vaccines are stored in Islamabad.

B. REFRIGERATORS: There are 2 different kinds of refrigerators.





COMPRESSION

* Powered by:
  electricity only

* Less maintenance but if
  problems cannot repair in field

* gets colder faster

ABSORPTION

* Powered by:
  electricity or
  gas or kerosene
* More maintenance
* Field repairs
  possible
* Slower to cool

Fig. 14-6. Types of Refrigerators
Source: WHO

HOW TO INSTALL YOUR REFRIGERATOR:

* keep all refrigerators (and freezers) in the same room
* install in the coolest part of the building
* they must be kept in a room with 4 walls and a roof.
* keep room ventilated at all times with a fan
* place away from windows and doors to **avoid draughts**
* There must be a space between the wall and refrigerator for ventilation: 300mm (12 inches)
* There must be a space between the ceiling and refrigerator for ventilation: 400mm (16 inches)

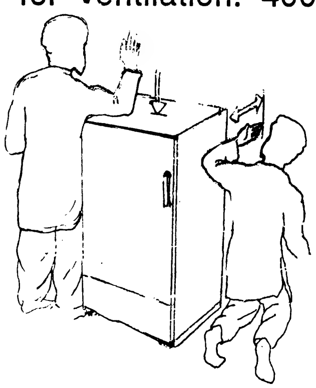


Fig. 14-7. Installing a Refrigerator
Source: WHO

* To keep the refrigerator dry, place it on wood blocks 25 to 50mm (1-2 inches) thick

* The refrigerator must sit **FIRMLY** and be **LEVEL**. This is **VERY IMPORTANT FOR ABSORPTION REFRIGERATORS.** Use the following techniques with a bowl of water and a string to check that it sits straight.

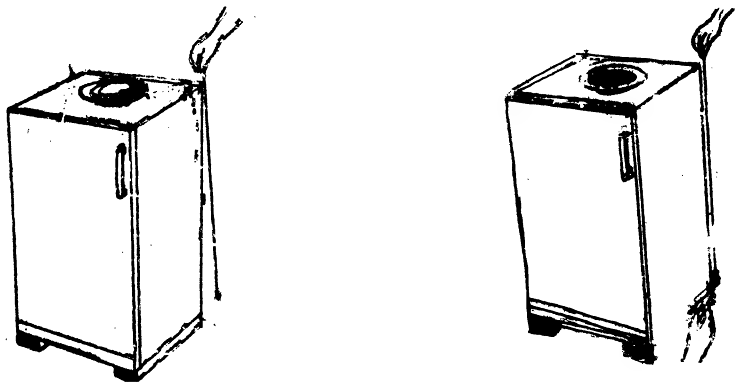


Fig. 14-8. Leveling the Refrigerator
Source: WHO

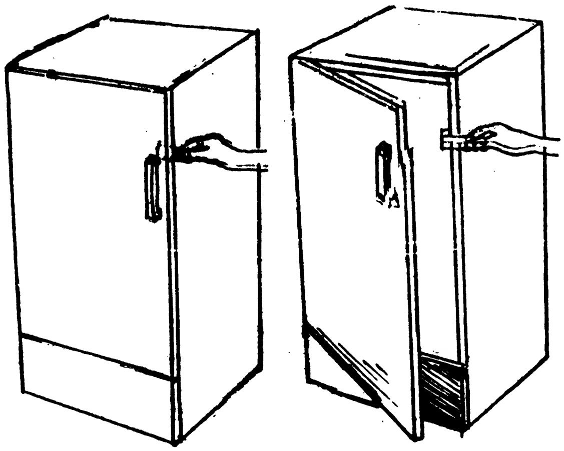


Fig. 14-9. Checking the Door Seal
Source: WHO

To check the door seal:

1. Place a paper strip on the seal and close the door
2. If it moves easily or falls out ask the cold chain technician to adjust it.
3. Be sure to do this checking all around the seal.

* Make sure the door opens and closes properly. If not call cold chain technician.

* Make sure that the door seals properly

HOW TO MAINTAIN YOUR REFRIGERATOR

ALL REFRIGERATORS

* Check the temperature to be sure it is between 0 and +8C at least **TWICE DAILY**, (more often the better) if possible without opening the door. Record results.

* Brush any dirt and dust off the back of the refrigerator condenser and cooling tubes **WEEKLY**

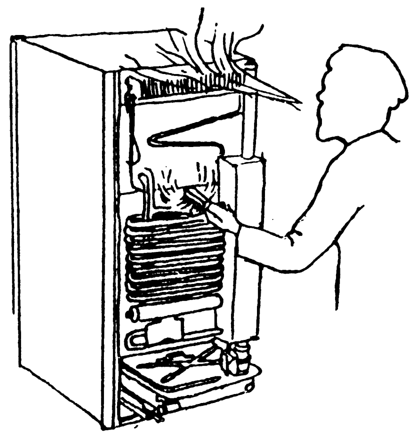


Fig. 14-10. Dusting the Back of the Refrigerator Source: WHO

IF THERE IS DUST AND DIRT ON THESE PARTS THE REFRIGERATOR WILL NOT WORK PROPERLY

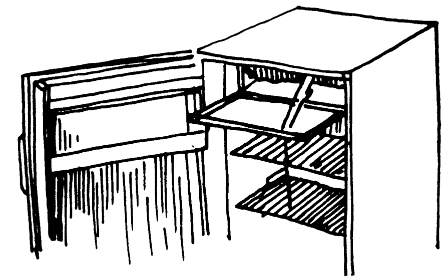
* Defrost the refrigerator if there is more than 6mm or 1/4 of ice on the evaporator

IF THERE IS TOO MUCH ICE ON THE EVAPORATOR THE REFRIGERATOR WILL NOT BE ABLE TO MAKE COLD

HOW TO DEFROST A REFRIGERATOR

1. Transfer vaccines to another refrigerator or cold box
2. Unplug unit or turn off gas
3. Open doors and let the ice melt
4. Remove ice with your fingers **NEVER USE A KNIFE OR SHARP OBJECTS.**
5. Empty drip tray
6. Wipe freezer compartment dry
7. Clean inside with mild soap and water and dry it
8. Turn power back on
9. Return vaccines to the refrigerator only after temperarature is down to +4C

Fig. 14-11. Deforsting a Refrigerator
Source: WHO



ELECTRIC

* Be sure the connection to the power is **PERMANENT**
* Tape the plug to the wall connection and any power switches in the ON position

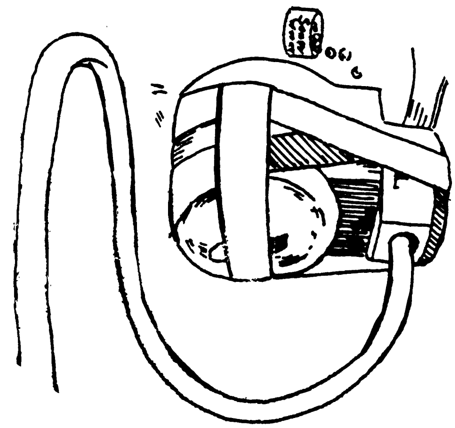


Fig. 14-12. Tape over the plug and switch
Source: TALC: The Cold Chain Slides script

GAS

* Be sure the refrigerator is away from draughts or the flame will blow out
* Always have a **SPARE BOTTLE OF GAS** in the room at all times.

KEROSENE is not used in the field anymore as gas is universally available and gas refrigerators require less maintenance.

DAILY MAINTENANCE

* Check to be sure temperature is between 0 and +8C **TWO TIMES A DAY** and record it.
* Make sure there is enough gas in the bottle daily.

  Weigh an empty gas bottle and record the weight. Then weigh your bottle daily as it is being used. This will give you an idea how many hours one bottle will last.

* Replace the bottle **BEFORE IT COMPLETELY RUNS OUT** and have it **FILLED IMMEDIATELY.**

* Check the flame daily. It should be blue. If it is not clean the jet and burner. Follow these instructions:

How to clean gas burner and gas jet:

1. Move vaccines to another fridge or cold box with ice
2. Turn off gas supply
3. Remove cover plates that protect burner
4. Remove jet which is on the gas inlet side of burner
5. Wash jet with spirits, petrol, or kerosene.
6. Blow it dry.
7. Look through the jet for any obstructions

* Never clean jet with a needle or wire brush as these will destroy it.

8. If blocked or damaged replace the jet with a new one.
9. Clean burner with a SOFT brush and blow out the dust.
10. Replace parts
11. Light the burner, holding down the button for at least 30 seconds after lighting (otherwise the flame will not stay on). Wait for the temperature to return to +4 C before replacing the vaccines

WEEKLY MAINTENANCE

* Check for ice formation on the evaporator. Defrost and clean inside if there is more than 6mm (1/4 inch).
* Check that the refrigerator is level.

IF DEFROSTING IS NECESSARY EVERY WEEK THE DOOR IS PROBABLY NOT SEALED CORRECTLY. CHECK THIS AND REPAIR IF NECESSARY

MONTHLY MAINTENANCE

* Check the outside for damaged paint
  clean
  remove rust
  paint
* Clean the inside with a damp cloth and mild soap
* Clean door gasket and powder it with some talcum
* Clean the flue if it has been smoking
* Check the gas line for leaks

CHECKING FOR LEAKS

1. Dissolve some soap in a small amount of water

2. Brush gas connections and pipe with soapy water
3. Open the valve on the gas bottle
4. Watch for bubbles
5. If you see bubbles THERE IS A LEAK
6. Tighten the leaking connection
7. If still leaking replace the part.

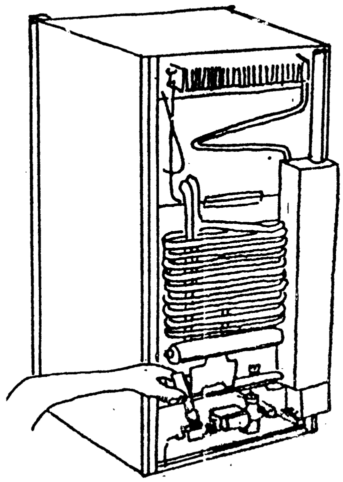


Fig. 14-13. Checking for gas leaks
Source:WHO

NEVER USE A FLAME OR SMOKE WHILE YOU ARE CHECKING FOR LEAKS

YEARLY MAINTNANCE

* Clean the gas burner and gas jet
* Clean the flue and baffle
  1. Turn off the gas supply
  2. Remove the burner protection plate
  3. Cover the burner with a clean cloth to protect it and to collect the dirt.
  4. Remove the flue top. Take the baffle out of the flue.
  5. Clean the flue with the specially provided brush
  6. Carefully wrap the dirt in the cloth **not spilling any on the burner**
  7. Wipe the baffle with a clean cloth
  8. Replace baffle and flue top
  9. Replace burner protection plate
  10. Light the burner, holding down the button for at least 30 seconds.

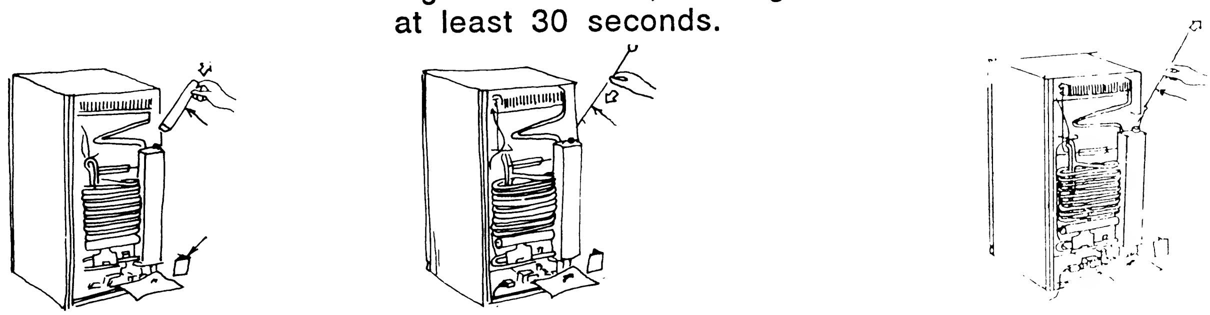


Fig. 14-14. Cleaning the flue and baffle
Source: WHO

HOW TO STORE YOUR VACCINES IN YOUR REFRIGERATOR

* Keep vaccines and diluents on the **TOP and MIDDLE** shelves of the main compartment.

NEVER FREEZE DILUENTS

* Stack vaccines in rows leaving 2 cm between each row to allow air movement.

VACCINES WILL NOT BE COLD ENOUGH IF THERE IS NOT SPACE BETWEEN THE ROWS OF BOXES

* Put the newest vaccines on the right side, using the older ones on the left first.

ALWAYS USE THE OLDEST UNEXPIRED VACCINES FIRST

* Keep the most heat sensitive vaccines on the **TOP** shelf as this is the coldest part of the refrigerator.
  - Oral Polio
  - BCG
  - Measles

* Keep the less heat sensitive vaccines on the **MIDDLE** shelf:
  - BCG
  - DPT, TT
  - Diluent

NEVER ALLOW TT/DPT/DT TO TOUCH THE BACK EVAPORATOR PLATE THIS MIGHT FREEZE THEM

* Keep bottles of water or unfrozen ice packs on the **BOTTOM SHELF**. This helps keep the refrigerator cold if the power goes off or when the door is opened.

* Clearly separate the different kinds of vaccines on the shelves

* Put vaccines that have been unopened and kept at 0 to +8C in the field in a box marked **"RETURNED"**. You may take these back to the field only on 2 additional days, then discard then even if still unused.

1.4. EPI DELIVERY STRATEGIES

In order to immunize all children before they reach their first birthday and women between the ages of 15-45 three strategies may be used.

In the Afghan Refugee programme static and outreach vaccination strategies must be offered in all refugee villages. Mass campaigns should only be used under special circumstances.

FIXED/STATIC IMMUNIZATION IN THE BHU

Full immunization services **MUST** be offered daily at each BHU. All women and children coming for treatment should not be seen unless they bring their EPI cards which must be screened to see if they need immunizations. Necessary vaccines must be given by the Dispensers, LHVs, or vaccinators.

NO OPPORTUNITY TO VACCINATE A WOMAN OR CHILD MUST BE MISSED

OUTREACH IMMUNIZATION IN REFUGEE VILLAGES

Teams consisting of 1 female and 1 male must work inside the refugee villages and offer vaccinations daily. The female should go door-to-door offering TT to women in purdah while sending eligible children out to collecting points for the male to vaccinate. To organize the Outreach Team work use the following steps:

1. Organize a meeting with the RV elders, maliks, and mullahs.
2. Present the problem of EPI and the need to vaccinate every child under age 1 and women 15-45.
3. Ask them to identify collecting points.
4. Ask them to help find:
   - defaulters
   - pregnant women
   - newborns
5. Schedule with them when the teams will visit.
6. Notify the area leaders at least 1 day before you visit.
7. Ask them to help assemble the eligible people.
8. Ask them to help you organize the session.
9. Ask them to send those missing to the BHU.

MASS CAMPAIGNS

In some areas the population live long distances from the BHUs or migrate with the seasons. In these conditions where it is more difficult to reach all of the women and children, mass campaigns may be organized. Use the following steps:

* Place ice packs on their **sides** in the freezer compartment.

* Put the 'RETURNED' thawed ice packs on the **RIGHT** side of the compartment and take new frozen packs from the **LEFT.**

FREEZE NO MORE THAN 4.8 KG. (8 LARGE OR 12 SMALL ICE PACKS) AT A TIME IN THE FREEZER COMPARTMENT. MORE THAN THIS WILL WARM THE COMPARTMENT.

* DO NOT put any food or drinks in the vaccine refrigerator. People will open and close the door too often getting these things out, making the refrigerator TOO WARM.

* **DO NOT** keep vaccines in the door shelves. It is too warm here.

* **DO NOT** keep 'EXPIRED' vaccines or 'OPENED PARTIALLY USED' vaccines in the refrigerator.

* **KEEP THE DOOR CLOSED**
  - -Opening the door makes the refrigerator warm very fast
  - -Plan what you need BEFORE opening the door
  - -Open it only 2-3 times a day at a maximum.

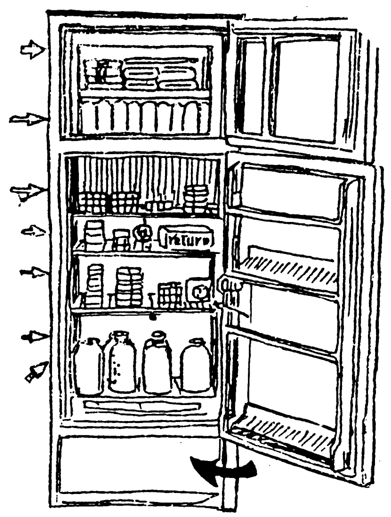


Fig. 14-15. Vaccines Properly stored in a refrigerator
Source: WHO

ICE LINED REFRIGERATORS/FREEZERS

Freezers are necessary for 2 things:

1. Storing OPV and Measles at -26 to -15 C at the Central EPI Office.
2. Making ice packs at the FSMO office.

The Afghan Refugee EPI programme uses **ICE LINING REFRIGERATOR/ FREEZERS** which can be used as a refrigerator <u>OR</u> a freezer. They are **COMPRESSION TYPE** and therefore can only be powered by electricity. Little maintenance is required, but if problems develop a technician is needed for repairs.

Ice lining refrigerator/freezers are most efficient because the water lining keeps it cold when the power goes off or when the door is opened. It can keep vaccines cold where there is only 8 hours. They are used at the FSMO level:

1. As REFRIGERATORS for vaccines
2. As FREEZERS for ice packs

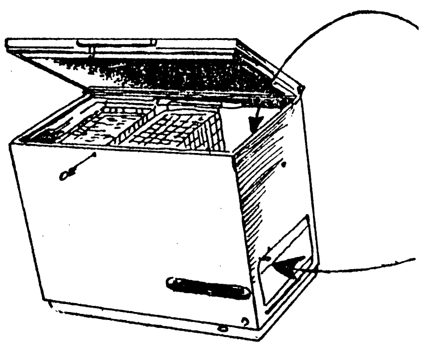


Fig. 14-16. Ice Lining refrigerators
Source: WHO

OPERATION OF ICE LINING REFRIGERATOR/FREEZER

1. Fill the plastic tubes inside the unit with water to make the ice lining.

   * Remove tubes

   * Fill with water leaving 8 cm.(3.5 inches) space at the top for expansion when the water turns to ice.

   * Put the cap back on the tube.

   * The water will freeze in 1-3 days.

   * The water must be completely frozen in the center of the tubes in order for the unit to keep vaccines cold during power failures. It is normal to find water in the top of the tubes.

2. Set the thermostat carefully. The knob has settings from 1 to MAX. MAX is the coldest setting. Number 4 is usually the correct setting where the outside temperature is above 40 C and there is electricity 24 hours a day. Experiment with the thermostat until the inside temperature is correct.

* If the unit is switched to operate as a refrigerator, be careful that the temperatures are not below freezing at the bottom of the chest.

DAILY MAINTENANCE

* Check to be sure temperature is between 0 and +8C **TWO TIMES A DAY and record it.**

* Be sure the connection to the power is **PERMANENT.**

* Tape the plug to the wall connection and any power switches in the ON position

WEEKLY MAINTENANCE

* Brush any dirt and dust off the back of the refrigerator condenser and cooling tubes.

IF THERE IS DUST AND DIRT ON THESE PARTS THE REFRIGERATOR WILL NOT WORK PROPERLY

MONTHLY MAINTENANCE

* Check the outside for damaged paint
  clean
  remove rust
  paint
* Clean the inside with a damp cloth and mild soap
* Clean door gasket and powder it with some talcum

HOW TO STORE YOUR VACCINES IN YOUR ICE LINING REFRIGERATOR

* Cover the bottom with ice packs.
* If you are storing few vaccines, store them in the provided baskets.
* If you are storing a large quantity, store each type in separate stacks.
* Leave space between stacks for air circulation
* Always store DPT/DT/TT on the top, as the bottom area is the coldest and may freeze them by mistake.

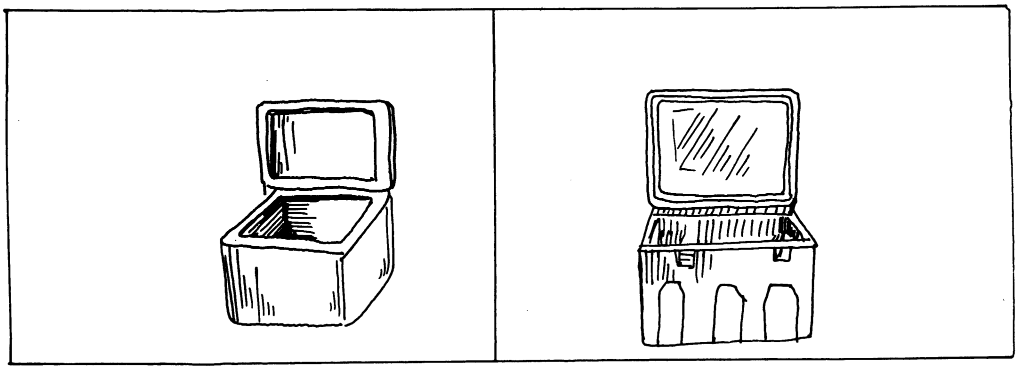
* Store ice packs in the small compartment on the right side of the unit.

14.5. COLD CHAIN TRANSPORTING EQUIPMENT

ALWAYS KEEP VACCINES IN COLD BOXES OR VACCINE CARRIERS WHEN THEY ARE OUT OF A REFRIGERATOR/FREEZER

A. COLD BOXES

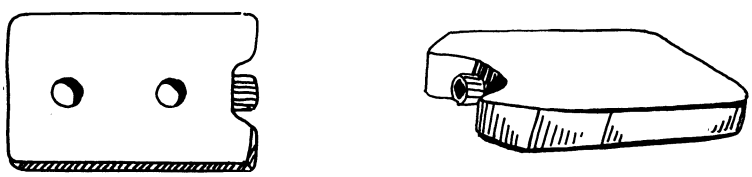
* The cold boxes used in the Afghan Refugee EPI Programme are the RCW-25 and the Spa Cold Box



RCW-25: Pack with 22 ice packs   Spa: Pack with 24 ice packs

Fig. 14-18. Cold Boxes
Source: HERC

* It should be packed with either (E5/09) 'Electrolux' 600 ml. ice packs or (E5/04) Rnsven AB 600 ml. ice packs



Electrolux E5/09   Rnsven AB E5/04

Fig. 14-19. Cold Box 600ml Ice Packs
Source: HERC

* If not opened, the cold boxes will keep vaccines cold for:

RCW-25:	Spa:
226 hours (9.5 days) at 32 C (Temperature)	196 hours (8 days) at 32 C (Temperature)
156 hours (6.5 days) at 43 C (Temperature)	132 hours (5.5 days) at 43 C (Temperature)

WHEN COLD BOXES ARE USED:

1. To keep vaccines cold during transportation
2. To keep vaccines cold while defrosting and cleaning the refrigerator.
3. To serve as an **emergency** storage when the refrigerator breaks down.

HOW TO PACK A COLD BOX

1. Remove ice packs from freezer and wait for them to reach 0 C.

   * When removed from freezer fully frozen, ice packs are usually -20 to -15 C. At this temperature they will freeze DPT/DT/TT.

   * If ice packs have frost on them they are TOO COLD

   * Leave them on a table 5-10 minutes until there is some water on their surface. This is about 0 C.

   * If you have ice pack indicators wait for the color to change from light yellow to **DARK RED.**
2. Put ice packs side-by-side in the bottom and all around the sides of the cold box.

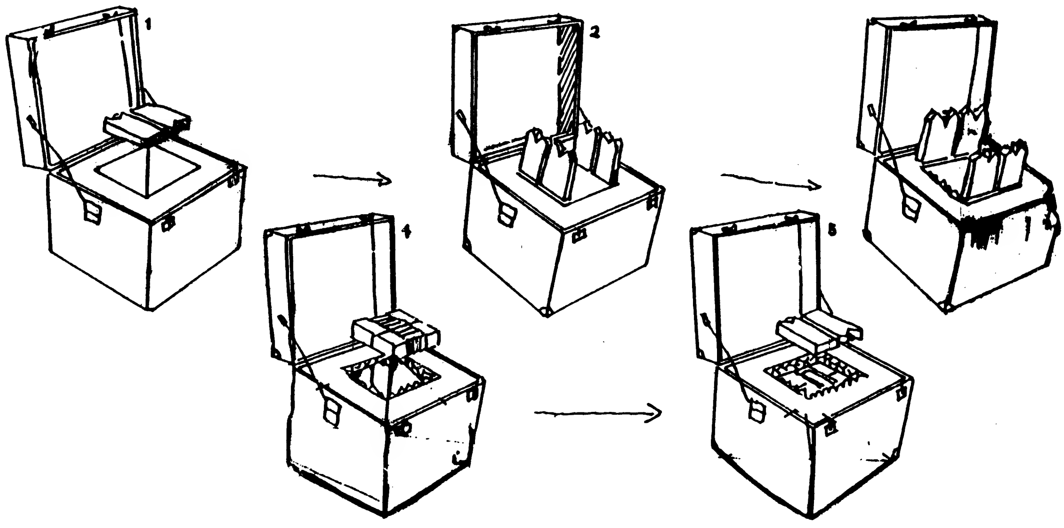


Fig. 14-20. How to pack a cold box
Source: WHO

3. Wrap DPT/DT/TT in foam, card board, or newspaper to protect them from freezing.

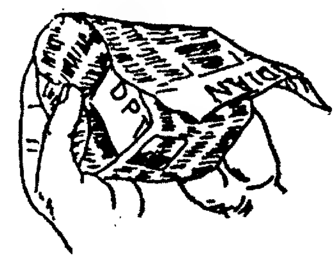


Fig. 14-21. Protecting DPT/TT/DT
Source: WHO

4. Put vaccines and diluent into the box

5. Put a thermometer and other monitoring devices in the box

   * Freeze watch for DPT/DT/TT
   * Vaccine Monitoring Card (VMC)

6. Close lid and secure latches tightly.

MAINTAINING THE COLD BOX

* Wipe out the box with mild soap and water
* Dry with a cloth
* Dust gasket with talcum powder
* Leave lid open by propping a piece of wood between the inside of the lid and the frame.

NEVER KEEP LID OPEN BY PUTTING A BLOCK OF WOOD OR ICE PACK BETWEEN LID GASKET AND THE FRAME. THIS WILL DAMAGE THE RUBBER GASKET SEAL CREATING AIR LEAKS IN THE LID.

B. VACCINE CARRIERS

Kinds used in the Afghan Refugee EPI Programme:

The following are the types used and the accompanying Ice Packs:

Type of Carrier (show sample	Type of Ice Pack (show sample)
1. E4/52 # 11-850-05 Manufacturer: Quattro Elle Spa	Ice Packs: 7 Kind: E5/10 400ml

* It will keep vaccines cold if NOT OPENED for:
  42 hours at +32C
  24 hours at +43C

Type of Carrier (show sample)	Type of Ice Pack (show sample)
2. E4/18 model 3504/38 Manufacturer: Thermos	Ice Packs: 4 Kind: E5/01 300ml

* It will keep vaccines cold if NOT OPENED for:
40 hours at +32C
33 hours at +43C

3. E4/53 model RCW-2 Manufacturer: Electrolux	Ice Packs: 2 Kind: E5/08 300ml

* It will keep vaccines cold if NOT OPENED for:
not tested at +32C
17 hours at +43C

WHEN VACCINE CARRIERS ARE USED:

1. To transport vaccines to EPI sessions in the field
2. To keep vaccines cold during vaccination sessions
3. To store extra ice packs in the field
4. To keep small amounts of vaccines cold while defrosting and cleaning the refrigerator.
5. To serve as an **emergency** storage for small amounts of vaccines when the refrigerator breaks down.

HOW TO PACK A VACCINE CARRIER

1. Remove ice packs from freezer and wait for them to reach 0 C.

   * When removed from freezer fully frozen, ice packs are usually -20 to -15 C. At this temperature they will freeze DPT/DT/TT.

   * If ice packs have frost on them they are TOO COLD

   * Leave them on a table 5-10 minutes until there is water on their surfaces. This is about 0 C. Or put them in a bucket of water until ice no longer freezes on the surface when they are removed.

   * If you have ice pack indicators wait for the color to change from light yellow to **DARK RED.**

2. Put ice packs all around the sides of the vaccine carrier.

3. Wrap DPT/DT/TT in foam or newspaper to protect them from freezing.

4. Keep vaccines and diluent in a plastic bag to prevent them from getting wet and the labels falling off. This is very important for 'RETURNED' vaccines.

NEVER USE A VIAL IF THERE IS NO LABEL OR IF YOU CANNOT READ THE LABEL AS YOU MAY USE THE WRONG VACCINE

5. Put the vaccines in the middle and center of the carrier.

6. Place a thermometer next to the vaccines

7. Place an ice pack on top of the vaccines

8. Place a piece of foam with holes to hold vaccines being used over the top.

9. Close lid and secure latches tightly.

RULES ON USE OF VACCINE CARRIER

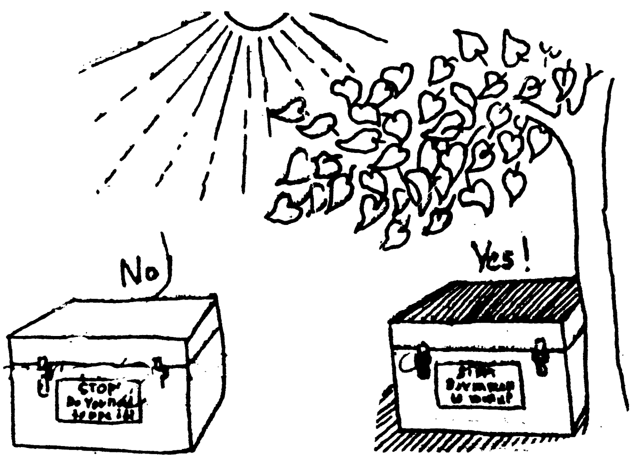


Fig. 14-22. Keep Vaccine Carrier in the Shade
Source:WHO

1. **NEVER** place your vaccine carrier in the sun.
2. Always vaccinate in a **SHADED** area.
3. Always keep vaccines that are opened and being used in the holes of the foam pad that covers the opening of the carrier.

   * Research has found that using foam:
     1. keeps vaccines in use colder.
     2. keeps vaccines inside colder.
     3. maintains lower temperature inside carrier.

   * Ice packs used outside the carrier to keep the vaccines that you are using cold melt too quickly.

4. Close lid after each withdrawal of vaccine.

MAINTAINING THE VACCINE CARRIER

DAILY MAINTENANCE

* Wipe out the box with mild soap and water
* Dry with a cloth
* Leave lid open
* Check for cracks. Cover any cracks with tape
* Check for damage of rubber seal and replace immediately when necessary. Dust seals with talcum powder.

14.6. ICE PACKS

Ice packs are one of the most important components of the cold chains as they are the only way to keep vaccines cold when there is no refrigerator.

They are your 'store of cold'

Make them in your freezer

This is what your freezer is for. You should not use the freezer for anything else in the field.

Only use the plastic ice packs provided by the EPI programme

NEVER USE GLASS BOTTLES AS THEY WILL BREAK WHEN FROZEN

NEVER USE ICE PACKS THAT HAVE A GEL OR CHEMICAL ADDED TO THEM THESE ARE EXPENSIVE AND NOT AS EFFICIENT. ALSO SOME PEOPLE MAY DRINK THE FLUID BY MISTAKE AND BECOME POISONED.

HOW TO PREPARE ICE PACKS

* Fill with clean, cold water only to the mark otherwise the expanded frozen water will break the ice pack. Put the cap on tightly

* Hold it upside down and squeeze it to be sure there are no leaks.

* Put it on its side in the freezer on the right side of the compartment.

* Freeze the ice pack until it is **COMPLETELY SOLID.**

* It takes the following times to freeze 1/2 liter ice packs solid depending on the kind of cooling unit you have:

Type of Freezer	**Days to freeze**
Absorption refrigerator with freezing compartment Electric Gas Kerosene	2
Compression refrigerator with freezing compartment, electric	1
Electric freezer	1/2

> FREEZE NO MORE THAN 4.8 KG. (8 LARGE OR 12 SMALL ICE PACKS) AT A TIME IN THE FREEZER COMPARTMENT. MORE THAN THIS WILL WARM THE COMPARTMENT.

USE OF ICE PACKS

* Always take solid frozen packs from the left side of the compartment.

* Remove ice packs from freezer and wait for them to reach 0 C.

  -When removed from freezer fully frozen, ice packs are usually -20 to -15 C. At this temperature they will freeze DPT/DT/TT.

1. Identify:
   - geographical location of target populations.
   - number of target population to be immunized.
   - number of staff who can immunize.
   - number of staff who can supervise.
   - number of days needed for one round.
   - vaccine vials needed
   - vaccine carriers/ice packs/syringes and needles

2. Meet with RVA officials, elders, maliks, mullahs, school principles, and social services. Discuss and identify:
   - Problem of EPI diseases.
   - Goal of mass campaign.
   - dates for campaign.
   - immunization sites.
   - site leaders.
   - people to collect eligible targets.

3. Design reporting forms for the campaign.
   - EPI cards.
   - Tally sheets.
   - Vaccine utilization forms.
   - Campaign compilation sheets.

4. Organize staff for the EPI days.
   - Assign tasks.
   - Provide training on operational procedures.

5. Organize equipment distribution
   - Cold chain centers
   - Immunization kits
   - Logistics/staff for replenishment

6. Organize community volunteers.
   - Assign tasks.
   - Provide training on operational procedures.
   - Provide guidelines on training of others:
     *School teachers
     *School children
     *Social workers
     *Community leaders

7. Design and organize media announcements
   - Design messages
   - Make posters/or organize announcements through mosques

8. Analyze results/problems and revise plans.

-If ice packs have frost on them they are TOO COLD

-Leave them on a table 5-10 minutes until there is some water on their surface. This is about 0 C. Or put them in a bucket of water until ice no longer freezes on the surface.

-If you have ice pack indicators wait for the color to change from light yellow to **DARK RED.**

* Return thawed packs to the right side of compartment **IMMEDIATELY** on returning from the EPI session

CARE OF ICE PACKS

* Do not drop ice packs-they can break

* Never leave them in the sun. Strong sunlight damages the plastic

14.7. COLD CHAIN MONITORING

A. THERMOMETERS

Thermometers are used in refrigerators, cold boxes and vaccine carriers to measure the temperature of your vaccines. **NEVER PUT VACCINES IN ANY CONTAINER WITHOUT A THERMOMETER.** Check the temperature of the container often:

COLD CHAIN CONTAINER	HOW OFTEN TO CHECK TEMPERATURE
Refrigerator	2 times a day
Cold box	3 times on departure mid-trip on arrival
Vaccine Carriers	3 times on departure mid-session on return

1. DIAL THERMOMETERS

* **YOU MUST PROTECT THEM FROM WATER IN YOUR CARRIER. KEEP IN A PLASTIC BAG**

* The needle moves around the scale, pointing to plus(+) numbers when it is warmer; and to minus(-) numbers when it is colder.

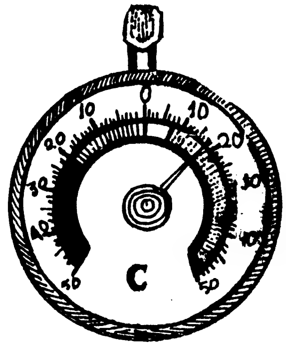


Fig. 14-23. Dial Thermometer
Source: WHO

2. LIQUID CRYSTAL THERMOMETER

2.1 Plastic Strip Thermometer

This is a plastic strip with circles on it which contain liquid crystals.

They change color depending on the temperature.

These changes are reversible, so you can continue to use the thermometer over and over again.

Below the circles are numbers which are 'degrees centigrade'

ALL CIRCLES ARE YELLOW: **TOO COLD FOR VACCINES**

ALL CIRCLES BLUE/BLACK: **TOO WARM FOR VACCINES**

GREEN CIRCLES: **0 - +8C VACCINES SAFE**

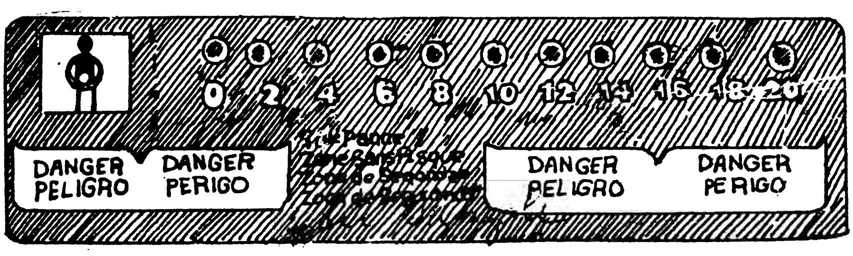


Fig. 14-24. Liquid Crystal Thermometer
Source:HERC

2.2 Electrolux Strip Thermometer

The number indicating a safe temperature 0-+8 will light up in a BLUE GREEN color

Too cold: square on the left will be seen saying DANGER **-2 to 0**

Too warm: A square on the left will be seen saying DANGER +10 to +12.

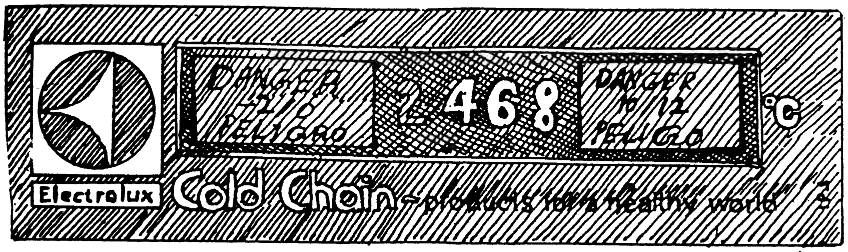


Fig. 14-25. Electrolux Strip Thermometer
Source: HERC

3. ELECTRONIC THERMOMETER

This thermometer is operated by battery. A small wire with a temperature sensor at the end is put inside the refrigerator. The other end is attached to the temperature reading box. This allows one to measure the temperature without opening the refrigerator.

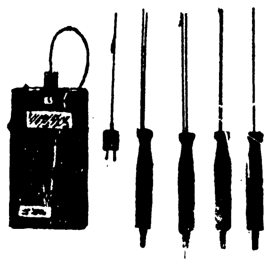


Fig. 14-26. Electronic Thermometer
Source: HERC

4. 7 DAY THERMOMETER

This thermometer is kept inside the refrigerator. It constantly marks the temperature on a round piece of graph of paper that rotates in a circle each hour.

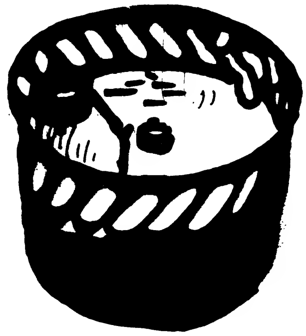


Fig. 14-27. 7 Day Thermometer

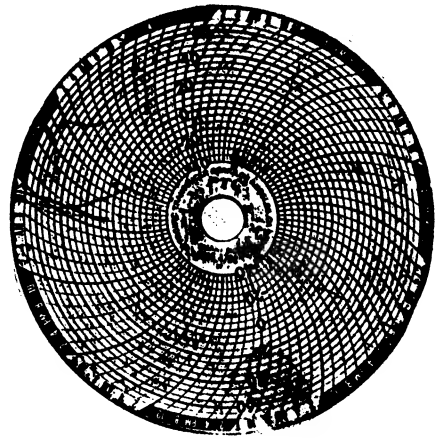


Fig. 14-28. Graph paper used for 7 day thermometer

It will constantly record the temperature for 7 days. The paper must be changed every week.

Therefore you have a permanent record of the temperature at every moment during a week.

B. VACCINE COLD CHAIN MONITORING CARD (VMC)

Vaccine cold chain monitoring cards arrive with the vaccines from the manufacturer and tell you if at any time during the journey whether the vaccines have been spoiled by heat.

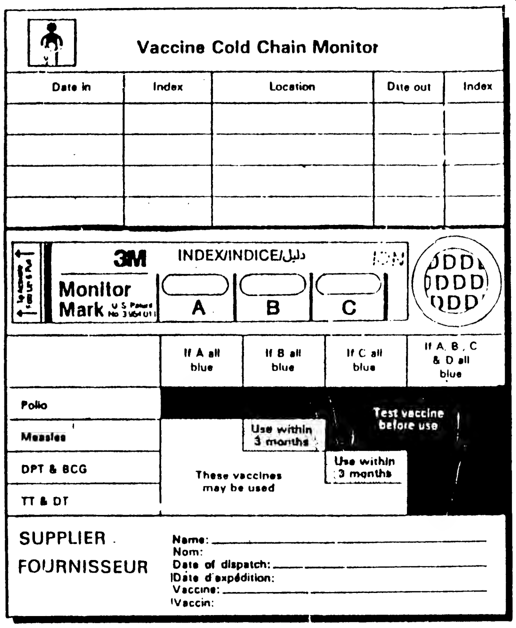
ALWAYS KEEP THE VMC REFRIGERATED WITH THE VACCINES

It is transferred with the vaccines in the cold box every time a vaccine is transported from one STORAGE station to another:

Islamabad to provincial EPI Office
Provincial EPI Office to FSMO office
FSMO to BHU office.

IT ALLOWS YOU TO KNOW IF THE COLD CHAIN HAS BEEN BROKEN AT ANY TIME DURING THE VACCINES JOURNEY

HOW IT WORKS


Vaccine Cold Chain Monitor

Date in	Index	Location	Date out	Index

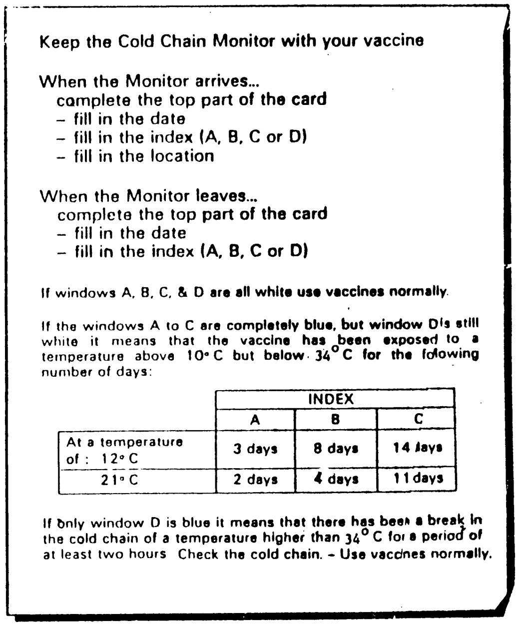
3M INDEX/INDICE/دليل

Monitor Mark U S Patent No 3 954 011

A B C

	If A all blue	If B all blue	If C all blue	If A, B, C & D all blue
Polio				Test vaccine before use
Measles		Use within 3 months		
DPT & BCG	These vaccines may be used		Use within 3 months	
TT & DT				

SUPPLIER · FOURNISSEUR
Name:
Nom:
Date of dispatch:
Date d'expédition:
Vaccine:
Vaccin:


Keep the Cold Chain Monitor with your vaccine

When the Monitor arrives...
complete the top part of the card
- fill in the date
- fill in the index (A, B, C or D)
- fill in the location

When the Monitor leaves...
complete the top part of the card
- fill in the date
- fill in the index (A, B, C or D)

If windows A, B, C, & D are all white use vaccines normally.

If the windows A to C are completely blue, but window D is still white it means that the vaccine has been exposed to a temperature above 10° C but below 34° C for the following number of days:

	INDEX		
	A	B	C
At a temperature of : 12° C	3 days	8 days	14 days
21° C	2 days	4 days	11 days

If only window D is blue it means that there has been a break in the cold chain of a temperature higher than 34° C for a period of at least two hours Check the cold chain. - Use vaccines normally.

Fig. 14-29. VMC Card

There are two temperature indicators that will change color if exposed to heat.

1. One is a strip Monitor Mark with 3 windows "A"/"B"/"C"

* if exposed to heat over + 10C a blue color starts to spread across window "A".

* if the temperature falls below +10C the blue color will not spread anymore

* each time the VMC card is exposed to heat over +10C the blue color will spread further across "A" to "B" and then finally to "C".

* it never returns to its normal white color

* The higher the temperature the faster the color blue spreads.

* The table on the back tells you the number of days needed at two temperatures for A/B/C/ to change to a blue color.

2. The round indicator labelled "D" turns blue after being exposed to +34C for more than 2 hours.

* Once it turns blue it cannot be made white again by cooling.

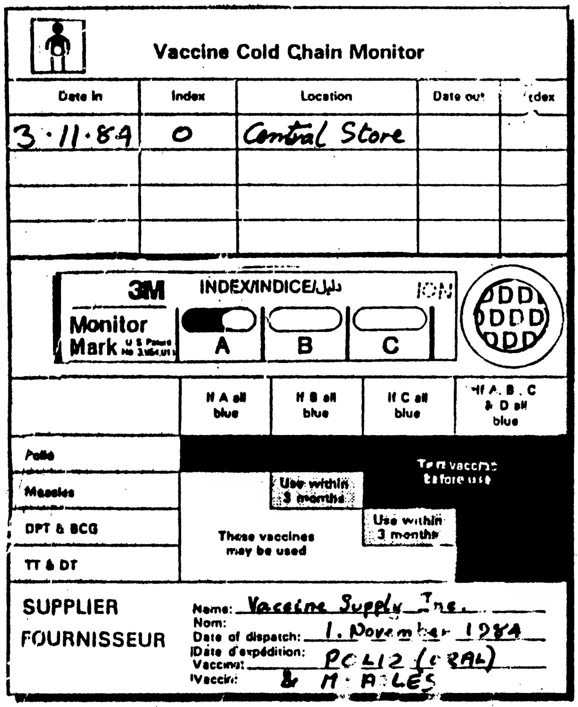


Fig. 14-30. VMC card after heat exposure
Source: HERC

HOW TO USE THE VMC

RECEIVING VACCINES

1. When you receive the vaccines **QUICKLY** remove the VMC from the shipping box or cold box.
2. Write in the date.
3. Write in the highest letter turned blue (for example)
   - If A/B/C/D are all white write "O"
   - If only half of A is blue write "O"
   - If A is totally blue but only half of B write "A"
   - If A and B are totally blue write "B"
4. Fill in your location
5. **QUICKLY** place it in the refrigerator with the vaccines.

SENDING VACCINES

1. When you send off the vaccines, **QUICKLY** remove the VMC from the refrigerator.
2. Write in the date.
3. Write in the highest letter turned blue
4. Fill in your location
5. **QUICKLY** put it back with the vaccines in the shipping cold box.

ALWAYS KEEP VMC CARDS WITH YOUR VACCINES IN COLD STORAGE WHEN DEFROSTING YOUR REFRIGERATOR OR WHEN TRANSFERRING THEM TO ANY OTHER STORAGE AREA

IF THE VMC CARD IS SEPARATED FROM THE VACCINES AND LEFT OUTSIDE BY MISTAKE, ALL THE WINDOWS WILL CHANGE COLOR AND IT WILL BE USELESS IN MONITORING ANY BREAKS IN THE COLD CHAIN.

WHAT ACTION TO TAKE

1. If A/B/C/D are all white use vaccines.

2. If "A" is all blue:
* Polio: test before use
* Measles }
* DPT & BCG } can be used
* TT & DT }

3. If "A" and "B" are all blue:
* Polio: test before use
* Measles: Use within 3 months
* DPT & BCG } can be used
* TT & DT }

4. If "A", "B", and "C" are all blue:
* Polio: test before use
* Measles: test before use
* DPT & BCG : Use within 3 months
* TT & DT: can be used

* Vaccines have been exposed to more than + 10C but less than + 34C for the following number of days:

	INDEX		
At temperature of:	A	B	C
+12C	3 days	8 days	14 days
+21C	2 days	4 days	11 days

5. If "A"B"C" and "D" are all blue:
* Polio: }
* Measles: } Test before use
* DPT & BCG : }
* TT & DT: }

6. If "D" is blue but A/B/C are still white:
* This means that the temperature was above +35C for a few hours (at least 2).
* There was a short break in the cold chain. CHECK THE COLD CHAIN.
* Use vaccines as normal

C. SHAKE TEST

If your freeze watch explodes or if you think any DPT/DT/TT has been frozen do this test:

* Select a vial that you think has been frozen
* Select another vial that you <u>know</u> has not been frozen
* Shake them vigorously and hold them up to a strong light
* Follow the pictorial guide below:

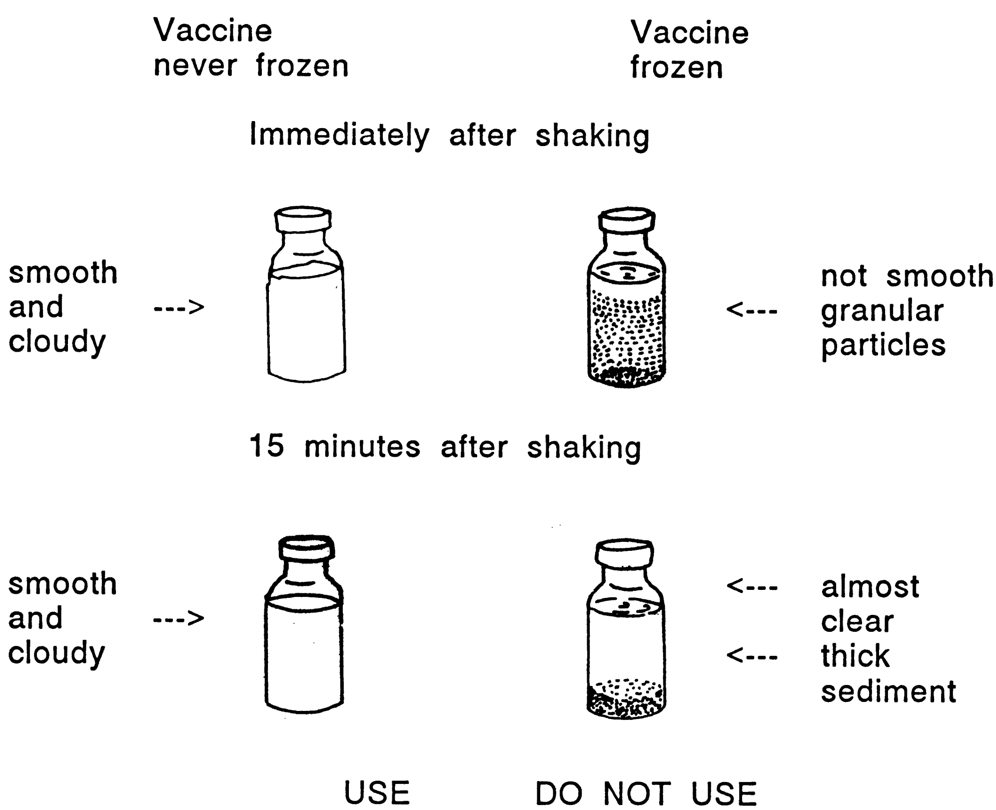


Fig. 14-31. Shake test.
Source: WHO

* Always compare 2 vials from the **same manufacturer**
* After some experience you should be able to recognize a frozen vial in 15 minutes.

D. FREEZE WATCH

* A freeze watch is used in storing and shipping DPT/DT/TT
* It tells you if they have been frozen.
* The red glass ampule explodes when the temperature is low enough to freeze DPT/DT/TT.

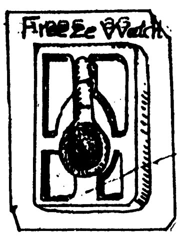


Fig. 14-32 Normal Freeze watch
Source: HERC



Fig. 14-33 Frozen Freeze Watch
Source: HERC

E. ICE PACK INDICATORS

* Ice pack indicators are used to tell you if your ice pack is too cold and therefore having the potential to freeze your DPT/DT/TT.

* A solid ice pack is -20C to -15C. **IT WILL FREEZE DPT/DT/TT/ AT THIS TEMPERATURE.**

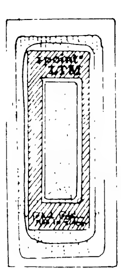
* Ice packs should be warmed up before putting them into a cold box or vaccine carrier containing DPT/DT/TT

HOW TO USE ICE PACK INDICATORS

* Attach the indicator to the ice pack when it is DRY and frozen

* Put ice pack in freezer and freeze solid

(yellow indicator)



(red indicator)

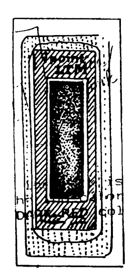


Fig. 14-34: Ice Pack Indicators
Source: HERC

* If the ice pack is too cold shows a **YELLOW** color.

* If the ice pack is safe the indicator to use the indicator shows a **DARK RED** color.

15. STERILIZATION

15.1. STERILITY AND CONTAMINATION

STERILE means with NO microbes are present on your equipment (bacteria or viruses).

The syringes and needles that you use must be sterile, so that you do not inject microbes into a person.

USE A STERILE SYRINGE AND A STERILE NEEDLE FOR EACH INJECTION

CONTAMINATED means that there ARE microbes on your equipment. There are micro-organisms everywhere:

-in the air
-on the table top
-on the floor
-on your hands
-in your nose and mouth
-inside people's skin
-in anything that has not been sterilized and kept sterile.

As soon as you touch a sterile instrument, or use it, or put it down on a table, microbes begin to collect on the instrument. Then it is **unsterile,** or contaminated.

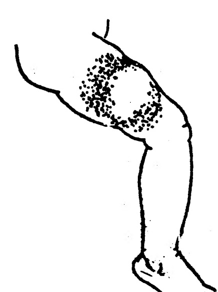
Instruments very quickly become contaminated when they are used. Syringes and needles must be handled very carefully to prevent contamination.

15.2. DANGERS OF USING UNSTERILE EQUIPMENT

DISPOSABLE NEEDLES OR SYRINGES MUST NOT BE USED MORE THAN ONCE.

If a person is injected with a contaminated syringe or needle there are 3 major risks:

SKIN INFECTIONS-ABSCESSES



(picture of abscess)

Fig. 15-1. Injection Abscess
Source:WHO

1.5. CONTRAINDICATIONS TO IMMUNIZATION

If the child looks healthy and has no specific complaints the course of immunization should be followed. Only seriously sick children should be excluded. This is because if a very sick child is vaccinated and dies, the family will think the vaccine killed the child. Fever, diarrhoea, malnutrition, early pregnancy should not be considered as a reason to deny a child vaccination. If you find a child who is sick and cannot decide if it should be vaccinated, send the child to the BHU.

NO CHILD SHOULD BE REFUSED A VACCINE DUE TO ILLNESS UNLESS SERIOUSLY ILL. IF YOU ARE UNSURE, SEND THE CHILD TO THE BHU FOR ASSESSMENT, TREATMENT, AND VACCINATION.

AFGHAN REFUGEE HEALTH PROGRAMME
PAKISTAN

MANUAL FOR EPI

Compiled by

Helen Murphy, RN, FNP, MHS
John Snow Incorporated
EPI Training Consultant

CHIEF COMMISSIONER FOR
AFGHAN REFUGEES
GOVERNMENT OF PAKISTAN

INTERNATIONAL RESCUE COMMITTEE

UNITED NATIONS
HIGH COMMISSIONER FOR
REFUGEES

ISLAMABAD

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